

In This Issue—Several New Models Are Announced

# MOTOR AGE

Vol. XLVI  
Number 8

PUBLISHED WEEKLY AT 5 SOUTH WABASH AVENUE  
CHICAGO, AUGUST 21, 1924

Thirty-five Cents a Copy  
Three Dollars a Year

**I COULD write ten thousand words and never say more than follows:—**

**A dealer in a town of 25,000 sold forty-eight Jordans and made more money than another dealer who delivered three hundred and fifty cheaper ones.**

*Edward S. Jordan*  
President  
Jordan Motor Car Company  
Cleveland, Ohio

# BLACK & DECKER HALF-INCH SPECIAL PORTABLE ELECTRIC DRILL

*"With the Pistol Grip and Trigger Switch"*



*Now*  
**\$58**

## PREFERRED BY MEN WHO KNOW

In a recent investigation in 10 states only three of the automotive repair men asked expressed a preference for any other make of electric drill.

This means more than anything we could say.

Carried in stock by leading Automotive Jobbers

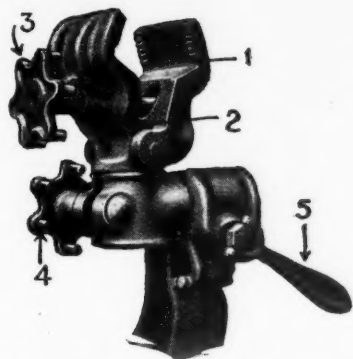
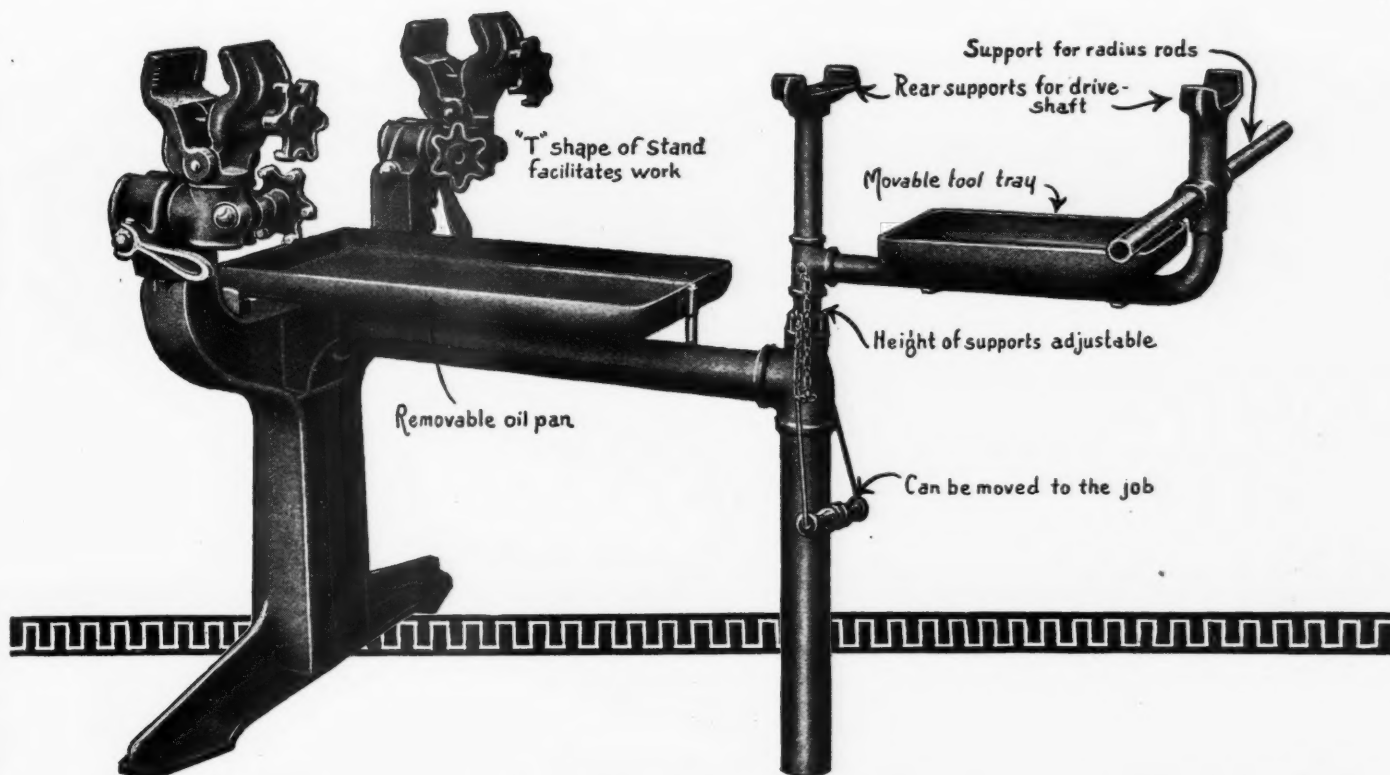
**THE BLACK & DECKER MFG. CO.**

**TOWSON, MD.**

Canadian Factory, Lyman Tube Bldg., Montreal, P. Q.

BACKGROUND PAT. 1924  
B & D. MFG. CO.





Large opening (1) for axle and drive shaft housings. Smaller opening (2) for axle shafts, etc. Part can be rigidly clamped by wheel (3) and adjusted to most convenient angle by wheel (4), controlling horizontal movement and tail nut (5), controlling vertical movement. With light pressure on friction clamps, part can be turned to desired position without readjusting clamps and yet supported with sufficient rigidity to be worked on.

## Introducing the new model 'F'

# WEAVER

## Universal Axle Stand

*for split and solid axles*

**I**N the new Weaver Universal Axle Stand, Model F, now introduced to the trade, we believe we have perfected the most nearly 100% efficient Stand on the market for handling passenger car and light truck axles. While its design makes it particularly adapted to split axles, such as are used on Fords, Chevrolets, etc., it can be used to equal advantage in handling axles of other types, including solid axles.

An especially noteworthy feature of this Stand lies in the fact that it is designed to enable the mechanic to handle practically every repair operation on the Stand in the most convenient position, saving the time and labor of removing it to the bench. The jaw clamps can be used as a vise to support the part, which can be readily adjusted to the most convenient angle by means of the two clamps, as shown in the accompanying illustrations. The two rear supports for the drive shaft can also be used to hold parts not being worked on.

These and many other unique features are described in detail in a special circular your jobber will be glad to send you. Write for it today.



Axle Housing is supported in convenient position for mechanic while axle and drive shaft are held on rear supports, out of mechanic's way and off the floor.

## Weaver Manufacturing Co.

Springfield, Illinois, U. S. A.

Weaver Canadian Co. Ltd., Chatham, Ont.

*The best equipped shop gets the business.*





Patented  
March 29, 1910  
May 2, 1922

OIL-REGULATING TYPE,

\$1.00 EACH

One to a piston

Up to and including 5 in. diameter

COMPRESSION TYPE, 25c and up

## POINT BY POINT, *Compare It With Any Ring!*

A good oil ring must be a good piston ring, *FIRST!* Laying aside the exclusive principle by which it regulates the oil, the PERFECT CIRCLE *Oil-Regulating* ring can stand on its merits as a piston ring, alone.

1. Made of the highest quality close-grained, resilient material.
2. Individually cast.
3. Rough ground by our own special grinders, eliminating the common fault—edge warp.
4. Finish ground to a limit of  $\frac{1}{2}$  thousandth, with a surface like polished glass.
5. A turned, quick-seating face, but smooth and velvety.
6. Absolutely uniform pressure against cylinder wall. (Flexible band test for circularity.)
7. Accurately sized to the right diameter.
8. Machined on inner diameter, insuring uniform wall thickness and tension.
9. Diagonal joint. Efficient, simple. Easy to fit.
10. Made by the oldest volume producer of piston rings now in existence.

Add to these qualities the exclusive *oil-regulating* principle by which PERFECT CIRCLES give 1000 or more miles to the gallon of oil, and you'll understand why they are used as standard equipment by more than seventy manufacturers—why jobbers and garagemen are finding them the most profitable replacement rings they have ever handled.

INDIANA PISTON RING COMPANY, Hagerstown, Indiana

JOHN H. TEETOR, President

CHARLES N. TEETOR, Vice Pres. & General Manager

Harkrader & Harkrader: Western Sales Agents, 1603 S. Michigan Ave., Chicago

# PERFECT CIRCLE Oil-Regulating Piston Rings

©1924

# MOTOR AGE

Vol. XLVI

No. 8

JULIAN CHASE, Directing Editor

B. M. IKERT, Technical Editor

W. L. CARVER, Field Editor

PAUL L. DUMAS

C. G. SINSABAUGH, News Editor

D. M. McDONALD, Detroit News Rep.

SAM SHELTON, Editor

DONALD BLANCHARD, Field Editor

A. H. PACKER

TOM WILDER

WARREN BAKER, Ass't. News Editor

CLARENCE PHILLIPS, Chicago News Rep.

Motor Age is published every Thursday by  
**THE CLASS JOURNAL COMPANY**  
 Mollers Building, 5 South Wabash Avenue, Chicago

C. A. MUSSELMAN

President and General Manager

A. B. SWETLAND, Vice-Pres. and Manager W. I. RALPH, Vice-President

E. M. COREY, Treasurer

HARRY TIPPER, Secretary

E. E. HAIGHT, Western Manager

Owned by United Publishers Corporation, 239 West 39th Street, New York; CHARLES G. PHILLIPS, President; A. C. PEARSON, Vice-President;

FRITZ J. FRANK, Treasurer; H. J. REDFIELD, Secretary.

Cable Address ..... Motage, Chicago

Telephone ..... Central 7045

## OFFICES

New York—U. P. C. Bldg., 239 West 39th St., Phone Pennsylvania 0080

Detroit—7338 Woodward Ave., Phone Empire 4890

Cleveland—538-540 Guardian Bldg., Phone Main 6432

Philadelphia—56th and Chestnut Sts., Phone Sherwood 1424

Indianapolis—1212 Merchants Bank Bldg., Phone Circle 8426

**SUBSCRIPTION RATES:** United States, Mexico and U. S. Possessions.  
 \$3.00 per year; Canada, \$5.00 per year; All Other Countries in Postal  
 Union, \$6.00 per year; Single Copies, 35 cents.

Member of the Audit Bureau of Circulations

Member, Associated Business Papers, Inc.

Copyright 1924 by THE CLASS JOURNAL COMPANY

## CONTENTS

Fifteen Years of Selling Automobiles.....	9
<i>By James Parker</i>	
Portable Tool Stand Makes Possible 30 Per Cent Reduction in Time for Carbon and Valve Job.....	14
Jordan Line Eight Made in Five Body Types.....	16
New Body Lines and Detailed Refinements Characterize Oldsmobile Six .....	18
The Eight-in-Line Elcar.....	19
New Body Type and Larger Engine Feature Late Series Oakland .....	20
MOTOR AGE'S Picture Pages of Automotive Interest.....	22
Four Standard and Three De Luxe Models in Jewett Line.....	21
The Readers' Clearing House.....	24
Boosting Accessory Sales.....	29
Getting More Out of the Shop.....	30
The Strain Invisible.....	31
<i>By A. H. Packer</i>	
Editorials .....	32
News of the Industry—	
Better Tone to Production.....	33
General Motors Net Much Under Same Period Last Year .....	34
General Motors Dealer Sales Off 7.7 Per Cent.....	35
All but One Willys-Knight Model \$100 Higher.....	35
Hudson-Essex Sales Ahead of All 1923.....	36
Wisconsin Motor Show at Fair Called Off.....	36
Dauvergne in Peugeot Wins Touring Grand Prix.....	37
Chicago Trade Association Proposes Move for Improvements.....	38
Car Impounding Act Sought for Indiana.....	40
Lexington Announces Price Advance.....	41
With the Associations.....	42
Squeeks and Rattles .....	43
Coming Motor Events .....	43
Specifications .....	44
BROADCASTER DEPARTMENT .....	103
INDEX TO ADVERTISEMENTS.....	104-105

Subscriptions accepted only from the Automotive Trade  
 Entered as Second Class Matter Sept. 19, 1899, at the Post Office  
 at Chicago, Ill., under Act of March 6, 1879.



A name  
 your customers know



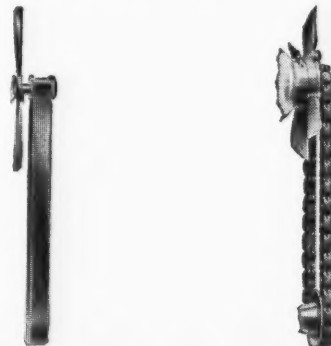
**H**ONEST quality and service have made Graton & Knight mean *better belting*. It has been the *standard* leather belting since 1851. The name and trade-mark are advertised to millions. So fan belts bearing the Graton & Knight trade-mark are easier to sell!

Graton & Knight Fan Belts more than justify the confidence of the buyer. Made as carefully as the big Graton & Knight belts that are turning machinery wherever power is used! Do their work as faithfully.

The same famous Graton & Knight *standardized* leather used. Tanned and curried to withstand motor heat, oil and water. True running. Tight gripping at easy tension. Save bearings. Do not require constant adjustment and attention. Graton & Knight Fan Belts give your customers perfect satisfaction even under the most trying conditions.

Made in Flat, "V" and Link "V" types. Priced to allow you a real profit. So well known that they are not "cut priced." Write your jobber to-day for prices and particulars of Graton & Knight belts.

**THE GRATON & KNIGHT MFG. CO.**  
*Worcester, Mass.*



**GRATON & KNIGHT**  
 Standardized  
**LEATHER BELTING**





## Is the First Sale the Last?

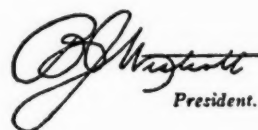
When you sell a man a car, is it the first and last time you will ever have a chance to sell him? Or will your customer be so well satisfied that he will want another car of the same make the next time he is in the market?

Westcott dealers are singularly fortunate in this respect. They enjoy the continued patronage of a large following.

The reason for this is not hard to find. Westcott cars are "built to endure"—to give trouble-free service over a long period of years. One sale inevitably leads to another later on.

If you would like to link up with a car in this enviable class, we shall be glad to give you complete details of the Westcott Sales Franchise as it applies to your territory.

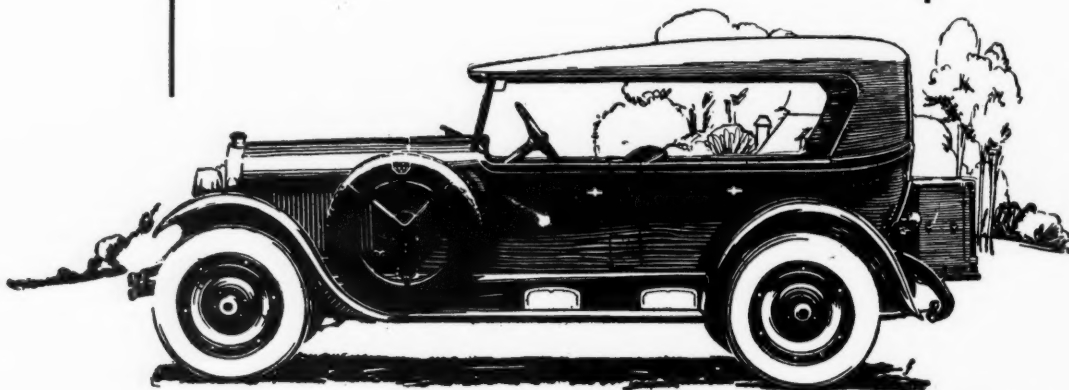
Write or wire today.

  
President.

---

THE WESTCOTT MOTOR CAR COMPANY - SPRINGFIELD, OHIO

---



# STUDEBAKER



## Public Confidence on your sales force!

"PUBLIC Confidence" sounds like a political phrase until you stop and think how it makes sales for you.

Today the automobile buyer very often "asks his friends"—and what his friends tell him about the car you sell and the service you give guides his hand to the dotted line.

You are an experienced automobile man—you know that there is great public confidence in the name STUDEBAKER—there is a good word everywhere for the car and for the nation-wide system which co-operates with the dealer to give every Studebaker owner prompt and perfect service at reasonable prices.

The dealer who sells Studebakers has the help of this, the greatest sales and advertising power in business, Public Confidence. And it applies with equal force to each of three different models and thirteen different body types.

It gives the dealer a three-fold opportunity for prestige and profit!

*Studebaker*

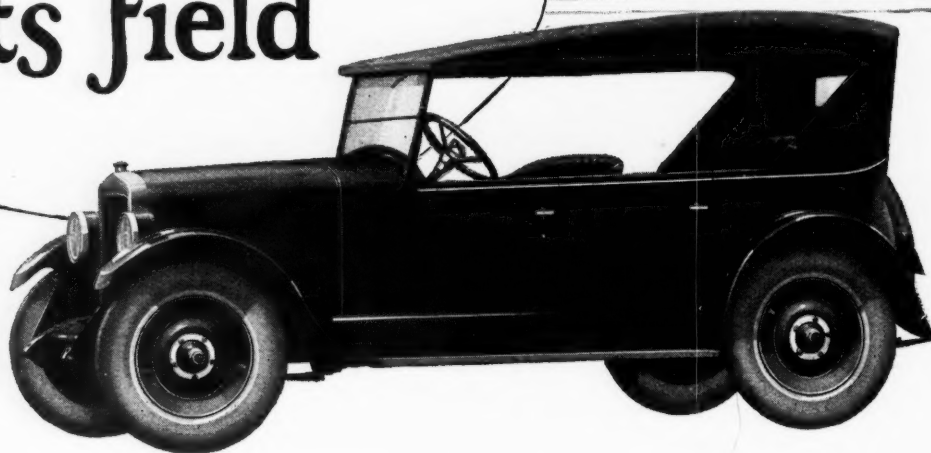
The Studebaker Corporation of America  
South Bend, Indiana

LIGHT SIX	SPECIAL SIX	BIG SIX
5-Pass., 112-in. W. B., 40 H. P.	5-Pass., 119-in. W. B., 50 H. P.	7-Pass., 126-in. W. B., 60 H. P.
Touring . . . . . \$1045	Touring . . . . . \$1425	Touring . . . . . \$1750
Roadster (3-Pass.) . . . . 1025	Roadster (2-Pass.) . . . . 1400	Speedster (5-Pass.) . . . . 1835
Coupe-Roadster (2-Pass.) . . 1195	Coupe (5-Pass.) . . . . 1895	Coupe (5-Pass.) . . . . 2495
Coupe (5-Pass.) . . . . 1395	Sedan . . . . . 1985	Sedan . . . . . 2685
Sedan . . . . . 1485		

(All prices f. o. b. factory)

T H I S   I S   A   S T U D E B A K E R   Y E A R

# A Year in advance of its field



SOME of this year's new models will have some of the advanced features Oakland added to motor car architecture last year—but none of them will have all.

The True Blue L-head engine reached a new high level of power plant engineering. Its basic improvements include building it to precision limits and fitting parts to standardized accuracy not elsewhere attempted in Oakland's price class—*unsurpassed in any class.*

Most cars will have four-wheel brakes this year—but Oakland's four-wheel brakes have a year of trial and proof behind them.

Oakland's logical grouping of controls on the steering wheel is still exclusive.

Duco finish is now shared with some of the higher priced cars.

Fundamental improvements, not sales innovations, have given this car a very high sales appeal among today's motor-wise buyers.

More than 40,000 True Blue Oaklands have made good on every road in America in the last twelve months.

The merchandise is right—you will like the way the factory does business. Write us!

Roadster  
Touring  
Special Roadster  
Special Touring  
Landau Coupe  
Landau Sedan  
Coupe for Four  
Sedan

OAKLAND MOTOR CAR COMPANY, PONTIAC, MICHIGAN





# Bosch

***Originators of Bosch Automotive  
Equipment Mark Their Units With the  
Full Name***

**ROBERT BOSCH**

***and the Trade-Mark Shown Below  
You Can Therefore Easily Identify  
the Genuine Bosch Products  
as Sold the World Over Since 1887***

***Magnetos ~ ~ ~ ~ Horns  
Generators ~ Starters  
Spot Lights ~ Hydrometers  
Magneto Generators***

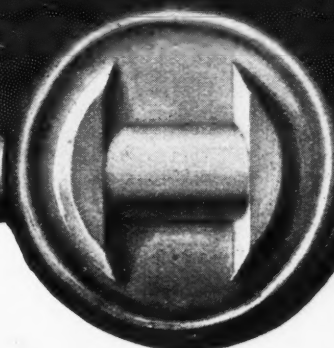
**ROBERT BOSCH MAGNETO CO INC.**

**Otto Heins, Pres.**

**123 West 64th Street ~ ~ ~ ~ New York City  
Service Stations in Principal Cities the World Over**

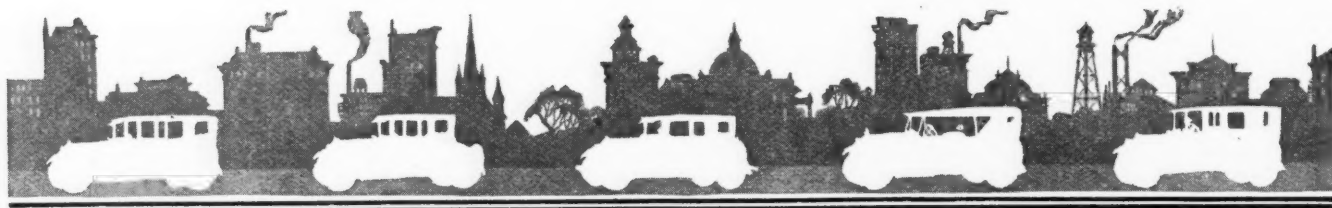
***Always look for  
this TRADE MARK***

***and Specify  
ROBERT BOSCH***



***Dealers, ~ Send For***

***Franchise Details***



# Diversity of products is the dealer's surest method for fitting most sales days into every business year!

The Reo Line  
PASSENGER CARS  
Four Models

SPEED WAGON  
12 Standard Bodies

PAY-ENTER BUS  
For City Service

SEDAN BUS  
For Highway Travel

REO TAXICAB  
Six Cylinder

PARCEL DELIVERY  
For Quality Merchants

Complete diversification, with but a single factory connection, is the privilege of Reo dealers, because the Reo Franchise covers the selling of motor vehicles to fit every phase of highway transport. Such a franchise deserves immediate investigation; write for information.

REO MOTOR CAR COMPANY, :: LANSING, MICHIGAN





# MOTOR AGE

## Fifteen Years of Selling Automobiles

*Interesting Observations of an Old Timer Reveal Many Changes in Salesman's Methods of Closing the Contract*

By JAMES PARKER

**I**T WAS fifteen years ago that I got into the automobile game as they called it then. Only about 100,000 cars were produced in America in that year. The foreign car was still the last word. Fifth Avenue was filled with costly De-Dions, Lorraine De Dietrichs, Benzs', Darracqs' and Renaults, with a moderate proportion of American makes, and the millionaire who bought one of the latter, was either an ardent patriot, or willing to take a long chance, for the foreign cars were undoubtedly more reliable.

This condition, however, was soon to change, for a year before, a leading American concern with a factory at Bridgeport, had put out a car good enough to win the Vanderbilt Cup, in a gruelling contest, and the two succeeding cup races also were won by native talent and machines. The general sales manager of the Bridgeport concern was a college mate of mine at Yale and through him I landed a job on the New York sales force.

### Takes Factory Apprentice Course

Before beginning my duties, however, I had to take a 12 weeks' apprentice course at the factory, spending some time in each department as an actual laborer. This car was practically all hand made at the works, and incidentally, it is still so made today. They gave me \$60 a month, a pretty good sum in those days, and I was lucky enough to get room and board with the engine-room foreman for \$3.50 per week.

For this I was the star-boarder, had the best room in his house and had my wash done free in the bargain.

As a start, I was put on as a helper in the engine room, and my first job was to squirt oil all over my hands and smear it around inside the cylinder blocks which had been brought in from the weathering heap in the factory yard. Incidentally, my friend the general manager, in passing through two days later, failed to recognize his grimy pal. There was a fine lot of mechanics on the job, mostly New Englanders, conscientious and hard working. My "buddy", like all the rest, chewed snuff, was a mild socialist and invariably lost all his savings from time to time in fake stock schemes.

From the engine room, I was set building transmissions, rear axles, putting chassis together, setting up body frames and putting on the aluminum, painting, ignition, and then graduated to tester's mechanic, and to drive the tow-wogan.

They were just changing at that time from the old make and break ignition to high tension, which is used today, and

two small kegs full of greasy iron plugs, each with a platinum core in it, sat under the work-bench. I had just begun to wonder if the foreman realized how many thousands they were worth when somebody beat me to it, and one morning they were gone. A great hullabaloo was raised, but no plugs were ever found. The testers, too, were a wild lot. Two of them got on a jag one day, and ended by running their car head on into a wall, overlooking the New Haven Railroad. The car stopped, but they both went on, and were found hanging unconscious in a maze of telegraph wires above the tracks. Luckily, they weren't badly hurt. The car had gotten a terrible wallop, but owing to its bronze engine base and transmission case being made exceptionally strong and heavy, it could still navigate. So we promptly had it (and the wall) photographed, and for several years it was a strong selling argument on reliability of construction.

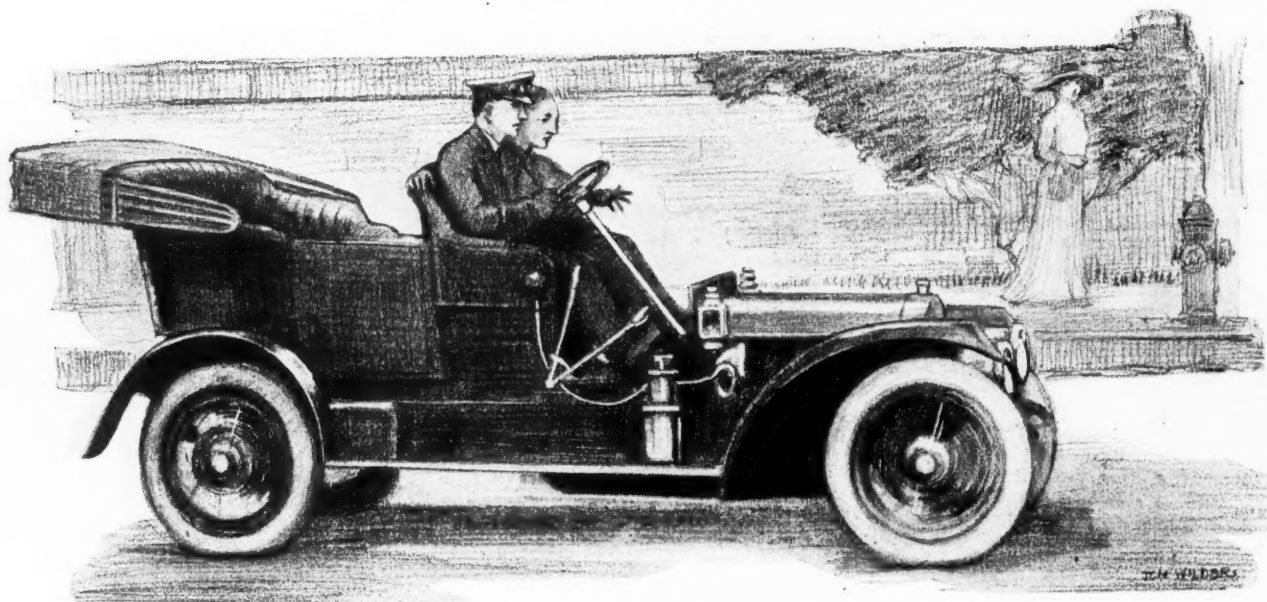
My first job on the tow car was to drive to the station and meet the president of the factory and I still cherish the nice 50-cent piece he gave me as a tip.

The car which had won the cup for America in the Vanderbilt contest the year before was stored at the factory, and was often the center of an admiring group of visitors. Incidentally, I sold it a year later to the son of a high official of the Standard Oil. Today with high speed motors of small cubic displacement, it couldn't even qualify, but 75 miles an hour was considered wonderful then, and only a few years before a road race to Tarrytown and back had been won with a car averaging only 30 miles an hour.

### Joins New York Sales Force

My factory experience was now finished and I was put in the New York salesroom, and almost at once the January show opened in Madison Square Garden. The first man I spoke to seemed interested and asked me a good many questions. Horrible grimaces from a brother salesman drew me to his side. "Lay off, nut," he whispered, "he is our Chicago branch manager," but fortunately, I had made a fairly good impression. In those days the shows were gala affairs. Everyone had an unlimited expense account. Entertainment was lavish and numbers of real sales were made. The best people came to them, and a salesman had to know his car, and be pretty much of a gentleman at the same time. Long demonstrations were made, sometimes as far as Philadelphia or Washington, if the party desiring them was well known, and the members of an





*It was 15 years ago I got into the automobile game*

organization were a more or less happy little family.

Lots of odd incidents occur in selling, and you never can tell a real customer from a fake until the check goes through the bank, or doesn't.

One unusually cold winter day a man came in with no overcoat or gloves, and not very well dressed. He spent an hour looking over the car, gave me his address and asked me to meet him with a car for demonstration the next day. I did so, and as I waited in the hall of a rather dingy home, a telephone man came in and told the maid if her boss didn't pay up, the phone would be taken out—fine prospect for a \$5000 car, thought I!! When my man appeared he still wore no gloves or coat, and in those days tops were always down, and there were no foredoors or windshields. He asked me to drive him to an address on Long Island, and though I was muffled to the eyes in a big fur coat, I nearly froze before we arrived. He asked me into a stone cold house. Not a servant in sight, gave me a big drink, said he liked the car and would see me again and let me out. I would have sold him as a prospect for two cents, yet three days later he gave me his order, paid in full with certified check, for a \$5000 car, with \$500 worth of extras. A very nice fellow, very eccentric, and some years later, shot and killed by his wife, a noted South American beauty.

Wealthy customers are often hard to handle, and must be humored. "They want what they want when they want it, and have been used to getting it, too." I remember once trying to sell a closed car to a copper magnate, whose ornate palace, roofed with the product of his mine, is rather a sight on Fifth avenue. He liked the car, but the body wasn't comfortable, and a custom built job took too long. Suddenly he turned and said, "What's the matter with the body of my present car?" which was an old French job, high and antiquated. "Nothin," I faltered, "but it is pretty high and a little out of date." "Nonsense, put it on

your chassis and I'll take it," he replied, so we did, though the fitting and repainting alone cost \$1400, which he paid without a whimper.

The so-called Fair Haired Boy Plunger of the Stock Market was another of my customers, and bought a \$12,000 job in less time than it takes me to tell it. Unfortunately, one of the body doors stuck, and as all the body men in the city were on strike at the time, it took us a week to fix it. This annoyed him so much that he sold the car almost immediately and I never could get him to look at our make again.

#### AN INTERVIEW WITH HENRY FORD

*Automobile dealers who think the trade is nearing its limit of development will find something intensely interesting in an interview with Henry Ford which MOTOR AGE will publish in its issue of August 28.*

*For that matter those dealers who take the opposite view will find this forthcoming article equally absorbing.*

*Decentralization of population—meaning a scattering of industry as well as of people and the upbuilding of rural communities—these are high spots in this intimate and prophetic discussion with the Detroit manufacturer.*

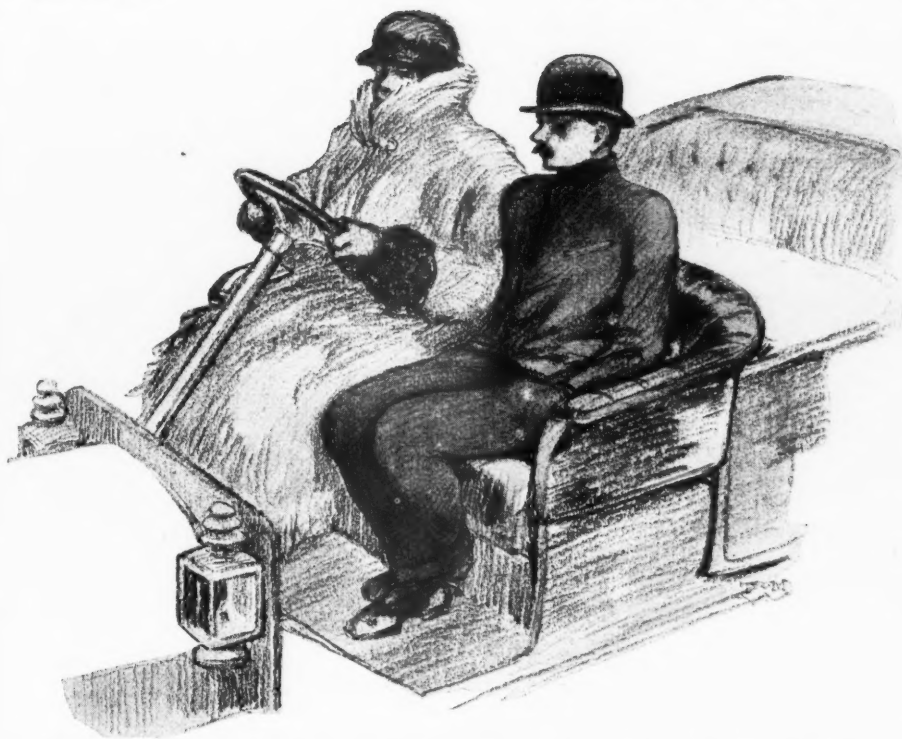
*The article will take you to the village industries established by the Ford organization which are entirely detached from cities and incidentally tell an engaging story about them.*

*This is something that every subscriber of MOTOR AGE will want to read.*

*Don't miss it.*

Another quick sale was made to an ex-president of one of the most powerful banks in the city, closely associated with Standard Oil. After a long series of calls at his office, most of which failed to get any result, I finally in jest told his secretary that I didn't believe his boss needed a motor car, because he'd never have time to use one—a vacation would do him more good. Whether he ever got the message I don't know, but within a few days he blew in and bought two at once, right off the bat. He had a friend with him and asked him why he didn't buy one, too. "Costs too much," was the reply, whereupon the magnate said, "I'll pay for it," and he did, making three sales all together. Nearly \$20,000 worth of business. It's easy when you're rich.

Competition was keen in those days, most cars were four cylinder affairs with big, slow speed motors, and some of the slogans like "Ask the Man Who Owns One" exist to this day. Our line was "The Best Built Car in America," and we brought out our first six cylinder car the year after I joined the concern. The polo contest was on between America and Britain, and I was commissioned to hire a box, and take down a party of wealthy and representative citizens in the new six, and a fine time we had; a leading multi-millionaire of the steel industry, a later president of the Automobile Club of America; a soap king and a few others. Lunch at the Plaza, late supper at the St. Regis. Expense account \$600, but—we got three sales, and how the car did perform, roaring down Long Island with the cutout open. For the idea then was to make all the noise you could. That was the year the Flivver King broke the Selden patent and liberated an industry at his own expense. In those days trade allowances were big—new cars were priced so we could give generous amounts on those taken in exchange. The man who paid cash, and had nothing to trade was a prize, and demountable rims, four doors, speedometers, windshields, and with some con-



*I nearly froze though muffled to the eyes in a big fur coat. I would have sold my prospect for 2 cents*

cerns even tops, were all charged for and paid as extras. The first self-starters cost about \$175 to attach and those manufacturers whose cars were not readily adapted for the installation gravely denounced the use of a starter as injurious to the motor.

#### Allow \$1,500 on \$8,500 Limousine

We made a double sale to a pair of partners, big theatrical men, who put on one of the most popular detective and mystery plays seen in New York, which lingers in my mind. The first chap had an old Benz, all shot to pieces and practically worthless, on which we gave him \$1500 on a \$8500 purchase of a limousine. His old boat was actually worth about \$900—so we took a paper loss of \$600, but on the other hand made around \$2100 on the new car sale and figured we were ahead on the game. His partner then blew in, with nothing to trade, but offered to buy if we would give him a 10 per cent discount for cash. Horrors! it couldn't be thought of, but, come to think of it, hadn't his partner turned in a nice Benz which could be seen in our used car department and if this was bought, say for \$900, we of the new car sales force would be pleased to take it in again at an allowance of \$1500 to apply on a purchase of an \$8500 limousine.

A light breaks—marvelous. The old Benz was duly run out of the used car department, solemnly sold by our used car man, who made his commission, by the way, and then appraised again at \$1500. Incidentally, the \$8500 limousine is running yet!

On another occasion I was having a terrible time trying to sell a fussy old gentleman a rebuilt car. He had plenty of money and wanted the car badly, but couldn't make up his mind to sign. I had argued, demonstrated and implored until

I was sick, and finally when he came in told him the car was sold, and the purchaser had paid a deposit of \$100. Right away he was all upset. It was just what he wanted, so he said. He should have signed before. Couldn't we see the purchaser and offer him a premium to release it? We might, and after a fake phone conversation with the mythical buyer, announced that he would sell his order for \$200 and take \$100 profit. Fine, said the fussy old fellow, and all unsuspecting, he made out his check. This man was one of the biggest real estate operators on upper Riverside Drive, and never regretted his purchase. Nor do I believe he would bear ill will if he should read this now.

Another time, a wealthy Cuban, recent sponsor of a railway bill which has caused a tumult in the Island, and president of one of the leading Cuban banks, was anxious to buy one of our big 40 h. p. four cylinder chain drive cars, but we could make no delivery and it seemed like a lost sale. When it occurred to some one that we had on hand a brand new body and that for three years preceding our chassis had been precisely alike. Presto—the chassis was thoroughly cleaned and painted, and the new body installed and our Cuban millionaire made happy with a complete unit which, so his chauffeur tells me, still runs as a sugar plantation truck to this day.

It is only recently, within 4 or 5 years, that time payments have come into being in any volume. Now you can pay down as little as one-third of the purchase price and the balance over a period of 12 months, with a moderate interest rate and finance charge, and a policy to protect you and the selling company against fire, theft or collision, but in the old days, it was a cash deposit, and the balance due in cash, or a certified check

when the car was ready for delivery. Usually, discretion was used, but I recall one incident where a wealthy banker had bought a car, and came in personally to take delivery. He took his bill, looked it over, sat down and wrote out his own check for the full amount.

The sales manager, a bigoted fellow, refused it as uncertified. In vain I told the man had written it himself, and under my own eyes. Nothing doing, it MUST be certified. So, telling my customer to excuse a little delay while his new car was being lubricated, I jumped into my own demonstrator, drove to his own bank and got it certified. How the clerks gaped at me for doing it and how amazed my banker was when he learned what had taken place. But he was a good sport, laughed at the manager, and is a customer of mine today. Another good friend bought a limousine painted a sky blue, with broad bands of gold along the hood, and around the body. The wheels were blue, with gold stripes and the upholstery was specially woven of blue silk with real gold threads. A double speedometer and clock was set in the inside of the car, as well as on the mahogany dash-board, and the total cost was around \$15,000. This man belonged to an old New York family on whose property north of the city a famous race track was situated, and in part payment, turned in an old "Orson" car, now long an orphan. When we went to get it, the car wouldn't start and we had to tow it back to town. Just as we were pushing it into the garage it leaped into life and crashed down an elevator shaft, killing a mechanic. The driver had left the switch on, and the ignition took that moment to work.

#### Queer Characters Met With

We had some funny characters around the show rooms at 76th street and Broadway. Little "Steve," who had only four toes on a perfectly formed foot, and "Otto," prodigiously strong, who for 50 cents would climb the pillars in the salesroom and bump his head on the ceiling. "Abe," the demonstrator, a fine driver, who could make a car stand on its head, and was a brother-in-law of Soubiron, the famous French Flying "Ace" in the World War, to whose unit he also was attached.

About this time my company was making an endeavor to break into Boston, which had heretofore been pretty well sewed up by two of our competitors and I was sent up there to take charge of the new organization.

Let me say right here that selling is absolutely different outside of New York, and that is why so many factories fall down entirely when they try to dictate a sales policy to apply to all centers along fixed lines. It simply can't be done. New York differs from Philadelphia; Philadelphia from Boston, and the best way is to pick out some good man and let him work out his own salvation in his particular field. Many will cry "heresy" at this, but I feel sure I'm right, and Boston was no exception to the rule.

In the five years that had elapsed since



I entered the business a lot of changes had taken place. To begin with, it was strictly forbidden to speak of it as "the auto game." It was now a staid, quiet business. Cars were no longer "pleasure cars," they were "passenger vehicles," as distinguished from trucks or commercial automobiles. Joy rides were greatly reduced, long demonstrations largely cut out. Salesmen's expense accounts cut down or entirely eliminated and long trades frowned on. For a while we even had a dealer's central bureau to which we were supposed to phone before quoting a trade price on a used car, but this was too good to last, and never found much favor in Boston, at any rate. National advertising was spasmodic, some concerns did quite a lot, and others practically none, one manufacturer asserting on a large sign board prominently displayed in all his salesrooms, "A little child can sell one." Although he is in many respects a very smart man, yet I think his selling ideas are wrong.

In Boston, our first sale was made to the brother of a former Governor, a very wealthy and influential man, who controlled immense mills in a village about 30 miles out. He was a big chap, over six feet tall, and with a mane of reddish hair. After a long battle he promised he would ride out with me to his plant, a trip he made daily, and the car he chose for the ride was a limousine with a light, faun-colored lining. Imagine how I felt when my prospect smoked one long cigar after another, flicking his ashes about carelessly, so that the interior looked like a pig pen, and then left me abruptly at his office with a "see you tomorrow, old man, tho' I think I like the other car (our competitor's) better." Next day he came in and gave me what proved to be the first of four orders.

"I always do just that when picking out a car," he said, explaining his actions of the day before, "and the man who smiles and takes it nicely gets my business."

#### War Boosts Business

The World War broke out that summer, and at first we had a bad slump, as everyone remembers, and then things came with a bang. Our factory got a \$3,000,000 truck order from England, the first of a series. Our plant doubled and tripled, and all our passenger cars were sold, gold at the dock, to the Russian, French and British High Commands, a period of feverish prosperity hit us then, from the effects of which some of us have never recovered, though from being pretty hard up, my firm emerged with a very full treasury. Then the U. S. A. jumped into the fight, and all the manufacturers were controlled directly by the government, and we produced as directed from Washington. The Liberty motor was developed, and trucks and tractors, caterpillars and touring cars poured overseas in an endless stream. Production facilities increased by leaps and bounds and when the war was won, and the smoke cleared away, the whole industry had greatly changed.

The car of today at a low price gives you a self-starter, electric lights, auto-



Big chap over 6 ft. tall and with a mane of reddish hair. The fawn-colored lining looked like a pigpen

matic tire pump, demountable rims, clock, speedometer and windshield cleaner, heater and a score of things that were either charged for or unheard of 10 years ago. The advent of the cord tire has changed tire mileage from 2500 to 12,000 or 14,000 with even more in prospect on the new balloon type, and the dollar spent on an automobile is one of the few dollars which gets you a return value for greater than it would have procured before the war.

The industry has been shaken down, incompetents have been weeded out. Profits per unit are much smaller, and that directly affects prices that can be few concerns figure on taking no loss at all on used cars turned in, although most used car departments still show a moderate deficit, when the cost of conditioning and selling the used car is properly figured out. The service departments of most of the large companies have been enormously bettered as a result of the experiences acquired from the war. Operations have been standardized, and at a fixed price so that an owner can know to the dollar just what a given job is going to cost him. Huge modern plants with better machinery installed have taken the place of ramshackle pre-war buildings, and from all this the owner benefits.

Selling methods, too, have entirely changed. Volume selling is now the rule, and the time that can be devoted to an individual prospect is much less. Less is needed, also, for the prospect usually has pretty well made up his mind to buy before he enters the salesroom, and in many cases his actual mechanical knowledge and experience exceeds that of the salesman who waits on him, a little haggling over his used car, probably a re-

quest for time payments which can easily be acceded to, if his credit is halfway good, a demonstration, perhaps, although even this is more often omitted than taken, and the deal is either closed or lost to some competitor who goes a little higher on the trade price. The industry has grown to vast proportions. Fortunes have been made and fortunes lost, but while admitting all the wonderful advances that have taken place, the "old timer," whether salesman or sales manager, still remembers half-regretfully the golden days when it wasn't a "business," but only a "game."

#### FIND REMEDY FOR BATTERY LOANING PROBLEM

The Toledo Battery Association comprised of approximately 40 dealers who are in the business of handling automobile storage batteries, has found a remedy for the "loaner" problem.

Each member is provided with a special stencil marked "rental" and this word is stamped on the lead connections of the battery so that it may be easily recognized anywhere as a rented battery.

The members have also broadcast the warning that dishonest trading of rental or "loaner" batteries will be prosecuted.

In the good old days it was easy for the motorist to take in an old worn-out battery and get a "loaner." When it, too, had run down, he carried it on to another battery shop and traded it in for another "loaner." The process went on ad infinitum to the loss of the dealers.

However, with the new plan of procedure the mishandling of these batteries has been brought down to the minimum in Toledo. Organization has enforced the same plan in almost all dealer shops.



# Selling Maintenance and Repairs on the Installment Plan

Selling motor vehicles on the installment payment plan has become a standardized practice. Recently the same system was adopted by tire dealers in some localities and the Flivver Shop, an establishment owned and operated by the firm Converse, Liefer & Green in Los Angeles, has applied the principle to maintenance and repair bills. This firm does not operate on the customary 30, 60 and 90 day periods of credit but welcomes everybody to bring in old cars for overhauling and accepts notes covering the obligation payable 90 days from date or at some other designated time agreed upon by both parties.

"The allowance price made by most Los Angeles dealers on cars that have been in service as much as three years or longer when offered as part payment on new cars is very small," stated a member of the Flivver Shop organization.

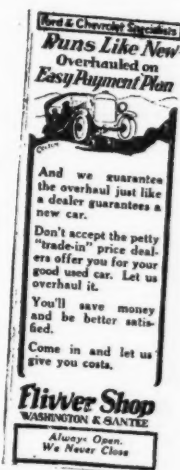
"In the vast majority of these cars are left many thousands of miles of service provided proper repairs are made. Owners realize that the cars are worth more to them than their trade-in value, but when they begin to think about the expense of the needed repairs they decide it is more advisable to let some dealer have the 'wreck' than it is for them to fit it up because of the expense involved. Those are the owners to whom we look for business."

When the Flivver Shop first inaugurated its system the business was conducted almost exclusively among owners of Fords and Chevrolets. The plan proved so satisfactory, according to members of the firm, the facilities were enlarged and mechanics employed who were schooled in repairs on practically every standard make. This has brought about a very pronounced increase in business, as experience shows, the owner of a medium-priced car is inclined to retain it provided he can finance the cost of a complete overhaul job.

There is not as much risk in accepting repair work on the deferred payment



*The Flivver Shop makes it a plan, so far as possible, to always explain the nature of a repair job to the customer*



*Two of the ads used by the Flivver Shop to get business and sell its plan of doing charging for repair work on the installment plan*

plan as might be imagined, according to the Flivver Shop. Most dealers and distributors insist on repairs being paid for on the cash basis. If the cost is very

large this often results in repairs not being made when first needed and the delay results in the bill being much larger when eventually the car refuses to function.

"We have to use our own judgment in taking on work and this usually serves us well. Of course we do not take every job offered. If an investigation shows the holder of the car is behind several months in his payments we do not want his work. There are thousands of cars in Los Angeles fully paid for but whose owners cannot finance a heavy repair bill all at once and these are the ones from whom we expect our business. In case the work should be brought in to us by someone who is not the legal owner if the cost of the job exceeds \$100 the law requires that we notify the legal owner and get his consent before the work is done. This serves to protect all parties concerned."

When a car is brought to the Flivver Shop for an overhaul job a road test and thorough inspection are made. Through the adoption of a flat rate system with modifications the owner is told what the approximate cost will be. He also is told that if further investigation shows the need for more parts than originally anticipated and the cost of these will exceed the first estimate he will be informed. As soon as the amount of the bill is ascertained the owner is required to sign notes providing for the payment. Usually 90 days is the outside limit but if the bill is high and the owner responsible an extension of time is granted.

In order to attract attention to its proposition the Flivver Shop maintains an advertising schedule in the leading newspapers. The copy used is small but attractive and has proved very productive. The shop equipment includes all necessary devices and according to the owners it is very seldom that any work has to be done outside. When new parts are required they are purchased through

(Continued on page 31)



*Two views taken in the Flivver Shop. A close inspection will show that it is toolled up very well with essential pieces of equipment*

## Portable Tool Stand Makes Possible 30 Per Cent Reduction in Time for Carbon and Valve Job

**A** THIRTY per cent reduction in the time required for a carbon and valve job on the Packard Single Six engine has been effected through the development of a portable tool stand containing everything a mechanic needs to perform this service operation. The stand was designed and its equipment determined by the Technical Service Department of the Packard Co. after a thorough study of carbon and valve work on both six and eight-cylinder engines. The factory is distributing the stand among its dealers, complete with all its equipment including a  $\frac{1}{4}$  in. portable electric drill, at a price of \$92.74. Considering the time economies it makes possible in conjunction with the fact that carbon and valve work forms a large percentage of all the work handled in a service station, it is evident that the stand is a good investment from a dealer's standpoint.

The Packard flat rate schedule places a time allowance of 7.2 hrs. on the carbon and valve job on the six-cylinder engine. With the stand, the average mechanic can do the work in 5.1 hrs. and, if an electric valve grinder is added to the equipment, the time can be still further reduced to 4.6 hrs.

When a mechanic is assigned to a job, the usual service station practice is for him to go to the tool room and draw such tools as he thinks he will need in addition to those in his kit. Frequently he overlooks some items and does not discover his oversight until he needs the

article he has neglected to provide himself with. This means either of two things. He must go back to the tool room to get it or else do without it; lost time being the result in either case. For example, suppose he forgets a special wrench and, rather than return to the tool room for it, he uses some other wrench as a makeshift. Obviously he won't work as fast as he could with the proper tool.

With the stand, however, the mechanic draws everything needed for a carbon and valve job on either the six or eight-cylinder engine, on one tool check. Nothing is overlooked. Once he rolls the stand up to a car he is in a position to carry through without any interruption. He wastes no time on return trips to the tool room nor in trying to make an ordinary tool do work for which a special speed tool is available. Furthermore there is no reason for him to enter the tool compartment of the car on which he is working to complete his working equipment. This last advantage is of considerable importance as these borrowed tools frequently not replaced with resulting complaints from customers.

The stand itself is a substantially built wooden structure mounted on four casters. It provides compartments, shelves and drawers for the storage of the equipment and, on its top, there is a holding clamp for the electric drill. In addition to the tools required for the work, there is a pail for use in draining the radiator,

a set of cowl and fender covers, a starting crank, wire brushes for use in conjunction with the electric drill for cleaning carbon, etc.

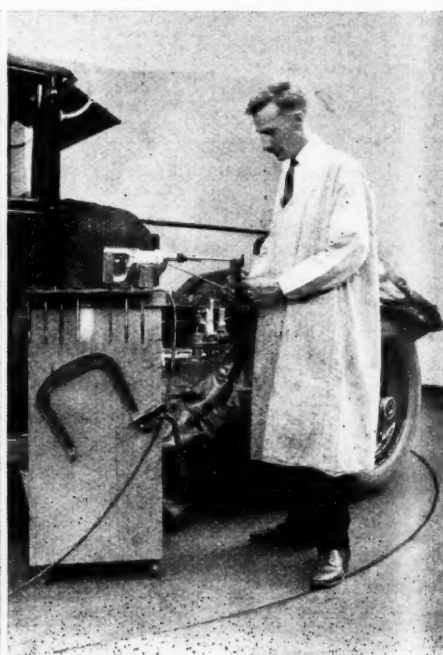
The tool equipment of the stand is for the most part standard. There are, however, a few special tools which the Packard Co. has designed as a result of the study of this class of service work. For example, there is a special speed wrench for taking off the cylinder head nuts. No standard brace was available which could be operated without interference with the radiator tie-rod. Consequently one was designed with an extra long shank so that the mechanic can run these nuts off quickly from a convenient working position.

Similar studies of other common service station jobs are being made with a view to making comparable time economies on them. Brake work is at present receiving attention. Analysis of the jobs handled over a period of months by a large distributor's service station, shows that about 17 per cent of the total were in this class which places it next to carbon and valve work, which forms about 30 per cent, in point of frequency.

Naturally the competition between the authorized dealer service station and the independent general or specialized repairshop, is keenest for the common repair jobs such as carbon and valve, and brake work. The dealer has little competition for the uncommon jobs but this class of work is not profitable because it



*At left, removing the cylinder head nuts with the special, long shank speeder wrench; center, the carbon and valve stand complete with its equipment as the mechanic draws it from the tool room; right, a special chuck has been designed for the electric drill for polishing the valve stems*





### EQUIPMENT CONTAINED IN PACKARD CARBON AND VALVE TOOL STAND

Putty knife	Starting crank
Hair brush	Valve lifter
Wire brush	Fleming valve guide cleaner
Carbon brushes (2)	Carburetor jet wrench
Cylinder head lifters	Pet cock drill rod
Fuelizer plug wrench	Breaker point file
Fuelizer plug puller	Can of grinding compound
Cylinder head nut wrench	Funnel
Cylinder head speed wrench	Chuck for electric drill
Spark plug speed wrench and handle	Extension cord
Carburetor wrench	Water pail
Set of tappet wrenches (3)	Gasoline pail
1/4 in. by 5/16 in. open end wrenches (2)	Fender covers
7/16 in. by 1/2 in. open end wrench	Cowl cover
9/16 in. by 5/8 in. open end wrenches (2)	1/4 in. electric drill
Breaker point wrenches (2)	Scraper for spark plugs
Valve grinding spring	Drill stand
Feeler gage	Oil can
6 in. screwdriver	Valve racks
Pliers	Pushrod rack

Cost.....\$92.74

### AUXILIARY EQUIPMENT

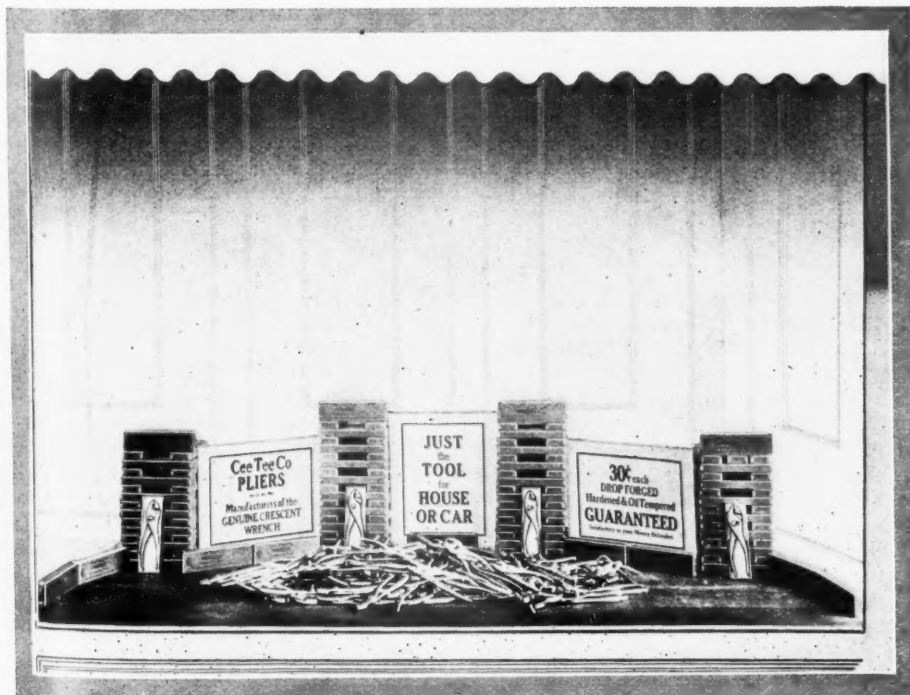
Black & Decker electric valve grinder	Combination valve refacing outfit
Speedo multiple valve lifter (2)	Flywheel timing mark indicator

Cost.....\$61.90

can not be obtained in volume. It is with the idea of placing its dealers in a position to offer the strongest possible competition for the classes of service

work that can be obtained in profitable volume, that the Packard company is carrying on this work on the most common service operations.

### Concentrating on Display of One Article or Type of Article Is More Effectual Than a Window Full of Odds and Ends.



Type of window display recommended by the Crescent Tool Co.

## A Window Message That Draws an Answer

THE window display that "scatters all over the store" including one sample of each article carried in stock, up to the limit of the display space, is very likely to defeat its own end. It tells the passerby something he probably knew already—that he is looking in at the window of an accessory store, but it does not give him the strong, concentrated buying impulse that brings him inside where the sale can be closed.

An improvement on the miscellaneous window display is that in which one class of goods is featured at a time. The dealer puts in a "Repair Window," follows it perhaps with an "Ignition Window," which in turn is succeeded by a "Lubrication Window," still more effective is the window which features one special item and tells a complete story. Accessory dealers are sometimes handicapped in this respect because stocks of any one item are not sufficient to fill a window.

This method of making a striking window display is being featured by the Crescent Tool Company, Jamestown, New York and the illustration shows the way in which they recommend displaying one particular item. In this case it is pliers which are being featured and the method they use not only takes advantage of the concentration idea but also gives the impression that a very large stock is carried. The assortment used for this display consists of a gross of slip joint pliers, six inch length, each plier packed in an individual box. The pliers are removed from the boxes and dumped in a pile as indicated while the boxes themselves are then stacked in pyramid formation in the background. Three or four pliers are left in the boxes with the lids removed to convey the idea that the balance of the boxes are also filled with pliers. While the idea has been featured in regard to one of the tools most commonly used by the car owner it could also be applied to many things in the accessory store. Whether the display would be inner tubes, stop lights or some other accessory the same plan could be used and suitable cards could be printed to describe the device and bring it to the attention of the observer.

### NEW BATTERY BOOKLET

The Proper Use and Care of Radio Storage Batteries is the title of a booklet just off the presses and being issued by the Willard Storage Battery Company through its service stations and dealers.

While the booklet is written around Willard radio batteries, the information contained in it is applicable to any lead-acid storage battery.

The text contains valuable hints and directions on the use and care of this type of battery as well as diagrams on the proper method of hooking them up, taking off detector voltages and tapping for "C" battery voltages.

This booklet may be had free at any



# Jordan Line Eight Made in Five Body Types

*Vibration Dampener Feature of L-Head Engine—Many Refinements in Design to Facilitate Maintenance Operations—New Design on Radiator*

THE great Jordan Line Eight is now in production in five body types all mounted on standard 125½-in. wheelbase chassis with an eight-cylinder-in-line 3x4¼-in. engine. The new car is said to have a speed range in high gear of from 1 to 2 m.p.h. up to 67 to 72 m.p.h. and to give from 14 to 18 miles to the gallon of gasoline depending on operating condition.

The new models supplement the present six-cylinder line, which is continued without change, prices on the two lines being as follows:

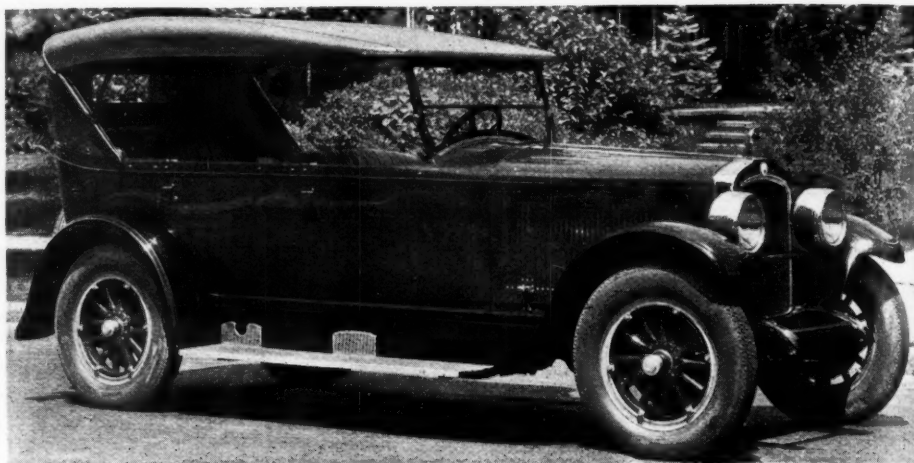
Silhouette Six	Great Line Eight
Phaeton .....\$1,775	Phaeton .....\$2,575
Blue Boy .....2,095	Playboy .....2,575
Victoria .....2,385	Victoria .....2,775
Brougham .....2,385	Brougham .....2,875
Sedan .....2,585	Sedan .....2,975

The new eight-cylinder engine is an L-head design with a piston displacement of 268.6 cu. in. and an N. A. C. C. rating of 28.8 hp. The actual horsepower is said to be 74 at 3,000 r.p.m. Cylinder block and detachable head are gray iron castings, the crankcase aluminum and the oil pan pressed steel. Four-point suspension is provided for the power plant.

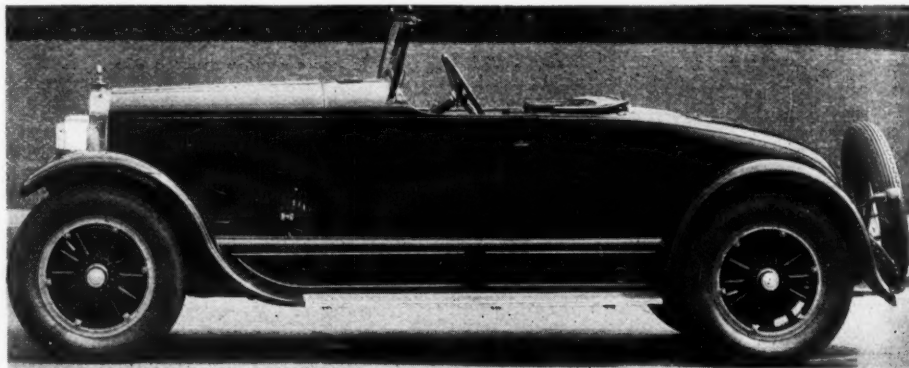
A feature of the engine is a vibration dampener in the form of a small flywheel mounted on the front end of the crankshaft. This shaft, which is put in both static and dynamic balance, is carried in five babbitt bearings all 2¾ in. in diameter and the following lengths: front 1½ in., intermediate 1½ in., rear 2½ in. Big end connecting rod bearings are of babbitt, the diameter and length being 2½ and 1½ in. respectively. The piston pins, which are secured in the pistons by snap rings and locking screws, have their bearings in phosphor bronze bushings in the rods. Pistons are of cast iron, 3¼ in. high with three rings all above the pin.

The front end drive is a No. 45 Morse chain which passes over crankshaft, camshaft and generator sprockets. The camshaft is a drop forging and is carried in five bearings. The diameters of these bearings increase from rear to front thus permitting withdrawal of the camshaft endwise. The valves are operated by mushroom cam followers. The valve alley is made readily accessible for adjustments by the removal of two cover plates. Alloy steel valves are used, the lifts being ⅝ in. and the clear diameters 1½ and 1¾ in. for the inlet and exhaust respectively.

Adjustment of the timing chain is provided for by swinging the generator. This operation is facilitated by means of an inspection hole in the timing case cover through which the tension may be gaged.



*The Great Jordan Line Eight touring model which sells for \$2575 f.o.b. factory*



*This is the Playboy model of the new Jordan eight-in-line car*

The generator is driven through a flexible coupling made up of a number of laminations of spring steel and is so mounted that it may be removed without disturbing the timing chain. The distributor is mounted on the generator and is driven off the rear end of its shaft through helical gears.

Oil is supplied under pressure to main, camshaft and connecting rod bearings by a gear oil pump located in the crankcase and driven from the camshaft by helical gears. The lubricant is conducted through tubing to each main bearing and thence through the drilled crankshaft to the pins. The camshaft bearings are supplied with oil from the main bearings by ducts drilled in the crankcase webs. The generator spocket bearing and the timing chain are also lubricated positively.

Crankcase drainage is provided for in a novel manner. The drain valve is of the poppet type and is held against its seat by a spring. It is operated from above by a pushrod. The level of the oil in the

crankcase is measured by a bayonet gage.

Cooling water is circulated by a centrifugal pump housed in the front end of the cylinder block casting. The pump rotor shaft, which also carries the fan, is supported by a bracket bolted to the block. At the pump end the shaft is supported in a bronze bushing and at the fan end by two opposed roller bearings. Grease cups are provided for lubrication of these bearings. The fan is a four-bladed design, 17½ in. in diameter, and is driven from a pulley which is integral with the vibration dampener.

Fuel is fed from an 18-gal. tank at the rear of the chassis to the 1½-in. Stromberg carburetor by means of a vacuum system. A United centrifugal air cleaner is regular equipment. The inlet manifold is 1½ in. diameter and is of the ramshorn design. The amount of heat supplied to the mixture may be adjusted by means of a control valve bolted to the top of the manifold casting. To change the adjustment, it is simply nec-

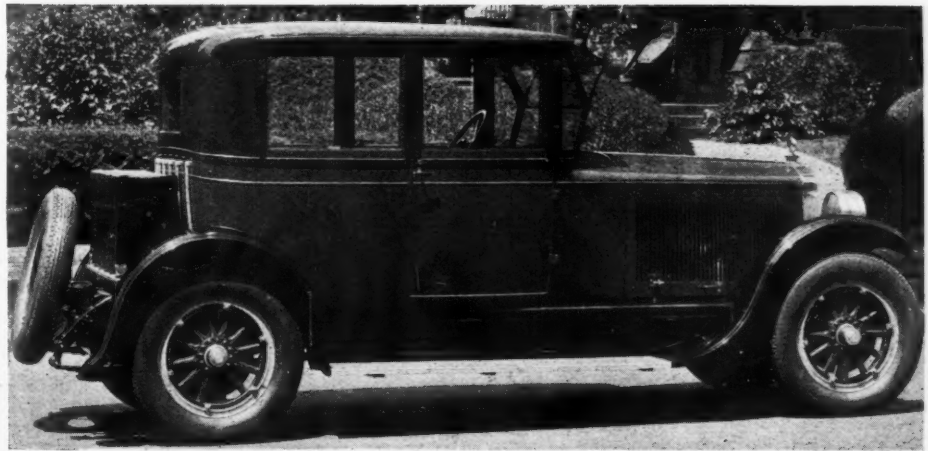
essary to remove the nuts, turn the control valve through 90 deg. and replace it.

The electrical system is a two-unit, single wire, six-volt American Bosch system.

Clutch and transmission gearset are mounted with the engine and both are products of the Detroit Gear & Machine Co. The former is a dry plate type and the latter provides three speeds forward and reverse. The mainshaft is carried in annular ball bearings while Hyatt rollers are used on the countershaft and for the clutch pilot. The propellor shaft is a 1 3/4-in. steel tube with oil-tight, metal universals at each end. Rear axle torque and propulsion are taken through the springs. The rear axle is a semi-floating Timken with helical bevel gears and a four-pinion differential. The pinion shaft is carried in three bearings and there are no bearings at each wheel. On the open models the reduction is 4 5-11 to 1. The springs are semi-elliptics, 2 in. wide, those in front being 37 in. long and those in the rear 55 3/4 in. The front axle is also a Timkin.

The steering gear is a worm and sector type of Gemmer make providing an 11 1/2 to 1 reduction. The pivot bearings are phosphor bronze bushings and a ball thrust. The steering wheel has a walnut spider and is 17 in. in diameter. The minimum turning radius is 20 ft. to the right and 22 ft. to the left.

Hydraulically operated four wheel external service brakes of the same type used on the six, are regular equipment on the new car. The hand brakes is a con-



*The Great Jordan Line Eight Victoria, an excellent example of the coach builder's art*

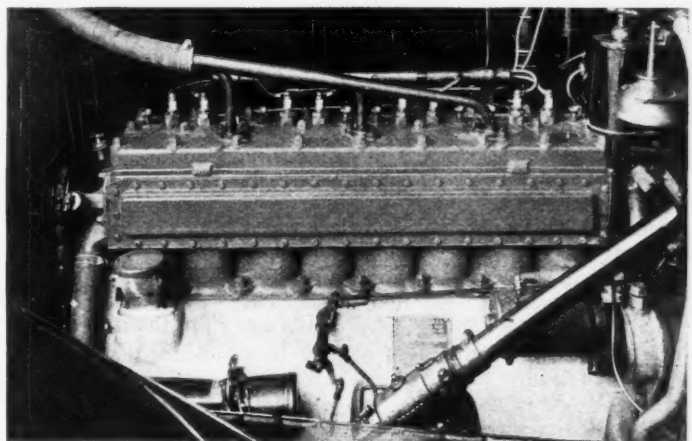
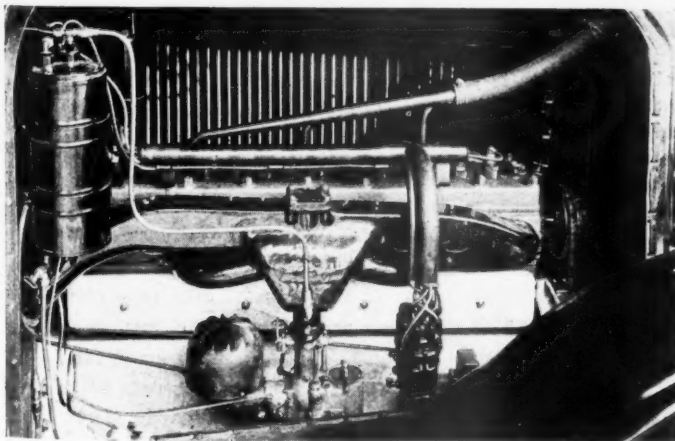
tracting type acting on a drum at the rear of the transmission.

The frame has a depth of 7 in. with three gusseted cross members and three tubular, torsion-resisting members. The wheels are wood, artillery type, with 12 spokes and the rims are Firestone straight side detachable. Balloon tires are regular equipment on all models. Chassis lubrication is by the Alemite system.

Fenders are of the double beaded crown type and the front spring and frame ends covered by a black enamel splashers. The radiator shell, head lamps, motometer and hood center hinge are nickel plated. A new design radiator shell is used with the center top line slightly raised. All models have auto-

matic windshield cleaners, Waltham clocks and speedometers, rear vision mirrors, cowl ventilators, and combination stop and tail lights. The instruments are grouped in two panels under glass, the speedometer and clock being in the right hand panel and the oil and gasoline gages, and ammeter in the left.

Two optional colors, dark blue and Crane Simplex gray, are offered and, in the closed models, a color option is also offered on the upholstery. The Brougham and Victoria are equipped with touring trunks containing two suit cases, and the new Playboy body has a comfortable rumble seat in the rear deck and a removable rear panel in the top. The closed bodies have Brewster type windshields.



*Two views of the eight-in-line engine used in the new Jordan. It is an L-head engine and provided with an air cleaner*

## Chevrolet Adds De Luxe Coupe and Sedan

The Chevrolet Motor Co. has added de luxe coupe and sedan models to its line priced at \$775 and \$940, respectively. Both are finished in gray Duco with a wax polish finish below the belt and black above with nickel trimmings. The accessory equipment regularly furnished with these models consists of front and rear bumpers, nickel radiator, moto-

meter and lock, corrugated rubber covered running boards, kick plates, disk wheels and wheel lock, oversize cord tires, plush mohair upholstery, cowl lamps, rear view mirror, adjustable visor and windshield wiper.

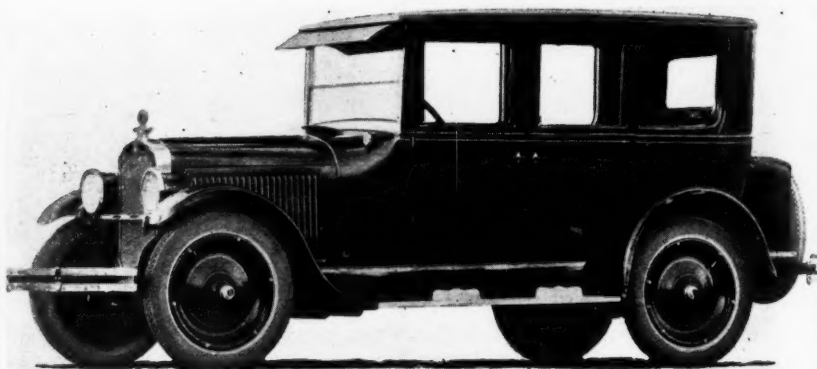
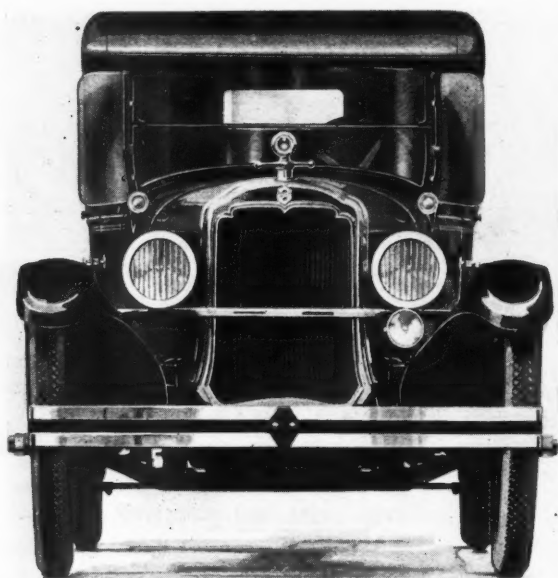
The two above closed models round out the Chevrolet company's de luxe models inasmuch as a de luxe touring

was put into production sometime last May. All of the de luxe models are mounted on the regular chassis. On the touring de luxe model the finish is a special one by Fisher, while the upholstery is in gray whale grain, with the top lining to match.

Owing to the shortage of space illustrations of the new de luxe closed models of the Chevrolet do not appear in this issue. Illustrations of both models will be published in an early issue of Motor AGE.



## New Body Lines and Detailed Refinements Characterize New Oldsmobile



At left, front view of new Oldsmobile showing the new radiator design. Above, the De Luxe Sedan

**N**EW body lines and Duco satin finish on all models are the features of the Oldsmobile line for 1925. Prices have been revised upward by amounts ranging from \$60 to \$115. With the exception of minor improvements in the engine and chassis, the car is continued without change. Balloon tires are offered as optional equipment at additional cost.

The most striking change is in the design of the radiator shell and hood. The former is nicked and has a double curve at the top with a slightly curved downward peak in the center which serves as a base for the Oldsmobile emblem. The sides of the shell are slightly concave and the width at the base is a little greater than at the top. The height of the shell has been increased which makes possible an almost level stream line hood. The hood follows the double curve of the top of the radiator shell. Bell shaped head and cowl lights, designed to harmonize with the new radiator lines, are standard on all models.

The standard models are finished in Oldsmobile blue with ivory striping on

body and wheels. The sport models are finished in weathered bronze-green with black and gold striping. Duco is used not only on the bodies of all models but also on the upper sections of the closed jobs. The standard open models are upholstered in black and the open sport models in heavily grained, Spanish finish Fabrikoid. The close models, all of which are equipped with metal sun visors covered with black Fabrikoid, are upholstered in a brown-taupe shade of striped velour. All closed bodies are by Fisher.

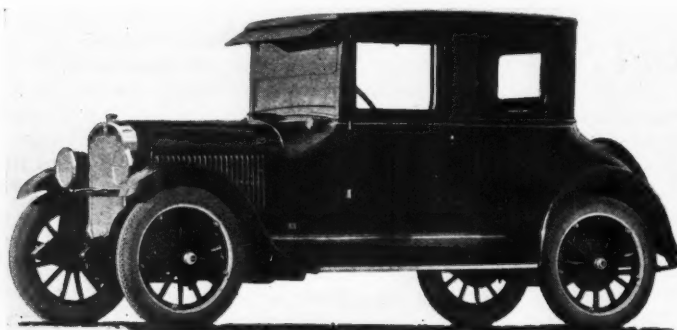
The instruments are now grouped in a nickel rimmed oval in the center of the board. The speedometer and the ignition and light controls are both enclosed in miniature reproductions of the new radiator design. Gearshift and hand brake levers are nicked on all models. In the sport and de Luxe models, a gasoline gage is included in the instrument group, the steering column is nicked and the steering wheel has an aluminum spider. On the sport open models, the instrument board has a dull nickel finish which is protected by lacquer.

The mechanical changes all come under the heading of detail refinements. The tappets are now of chilled cast iron in-

stead of steel and the split wrist pin bushings used previously have been replaced with the solid type. To facilitate the removal of the snap rings which hold the piston pins against endwise motion, small slots are milled in the piston walls at the bosses. These slots permit the use of a sharp tool for this work.

In the engine, the oil pump is driven off the end of the camshaft and is mounted on the front end of the block. It is supplied with oil by an external pipe leading from the crankcase. A ball check valve has been placed in the lower end of this pipe to permit the pump from losing its prime and, near its upper end a Y connection has been inserted. One leg of this Y is closed with a 1/8 in. pipe plug which can be easily removed if it is desired to prime the pump with an oil can. Formerly the oil supply was drawn from the side of the crankcase but now a short length of tubing has been provided so that the point of inlet is at the center of the crankcase. This insures a continuous supply of oil even if the car is at a considerable transverse angle. To prevent the collapse of the water pump inlet hose, a helical brass wire spring

(Continued on page 20)



At the left, the 4-passenger coupe; at the right, the 5-passenger special phaeton



## The Eight-in-Line Elcar

**T**O ITS regular line of fours and sixes the Elcar Motor Company of Elkhart, Indiana, has added a new model known as the B-80, this car being equipped with the Lycoming Eight-In-Line engine, thus offering to Elcar dealers a line of motor cars with which to meet all classes of competition. The engine has  $3\frac{1}{8}$  in. bore and  $4\frac{1}{4}$  in. stroke, giving a piston displacement of 260.7 cu. in. The wheelbase is 127 in.

The S. A. E. horsepower is 31.3 while the brake horsepower developed is 62, this peak being obtained at 2600 r.p.m. The highest torque, which is 150 lb. ft., is obtained at 900 r.p.m. The motor equipment includes Swan high turbulence intake manifold, dual flywheels, automatic oil regulation, with pressure feed to the main and connecting rod bearings. The oil regulation is automatic, the flow being increased with increase in throttle opening.

Body styles available on the Eight-in-Line Elcar include a seven passenger sedan listed at \$2765; a demi-sport touring (trunk in rear) listed at \$2165; a seven passenger touring (trunk in rear) listed at \$2265 and a roadster listed at \$2315, the prices given being F. O. B. Elkhart, Ind. The open cars are trimmed in genuine leather and the sedan is trimmed with mohair.

Both open and closed models are painted Thebes Gray with black and striped moldings and light or coach blue with black and striped moldings.

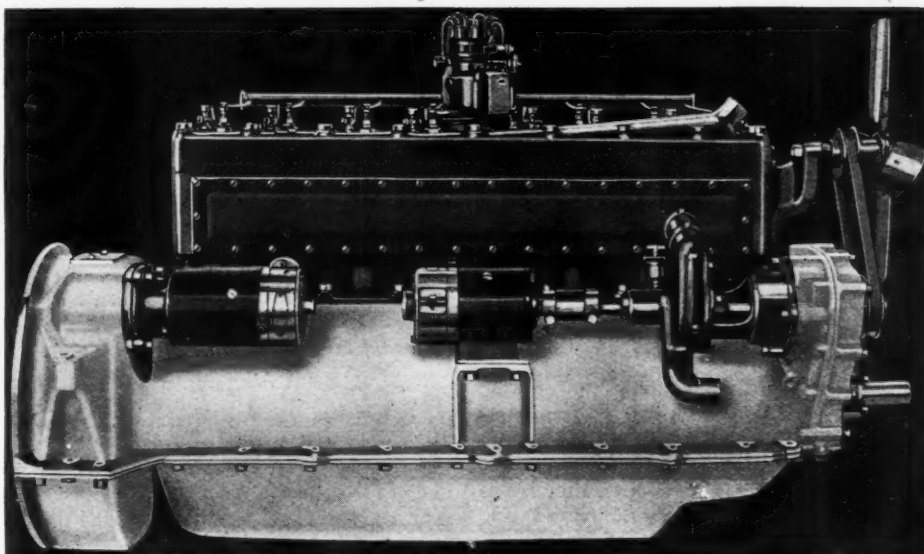
Other equipment includes electric horn, speedometer, ammeter, oil gage and motometer, also automatic gasoline gage on instrument board. Bumpers are furnished front and rear while balloon tires, 32x6.20, are supplied as regular equipment, these being supplemented by Gabriel snubbers designed for use with low pressure tires. Closed models are provided with heaters.

Braking is effected on all four wheels by means of the Lockheed hydraulic system.

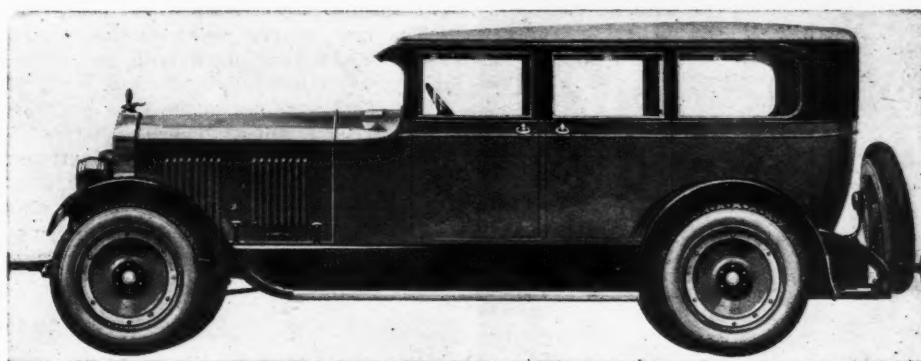
A Ross steering gear is used, this being of the cam and lever type construction. Salisbury axles are used front and rear, the differential ratio being 4.7 to 1. A Borg and Beck single plate clutch with Warner three speed transmission are among the units embodied in this eight cylinder chassis.

In the construction of the power plant, five main bearings are used to support the crankshaft, there being two crankshaft throws between any pair of adjacent bearings. These bearings are supported by webs in the crankcase, stiffening ribs also being used between cylinders where there are no bearings, thus producing a very rigid crankcase construction.

Light weight cast iron pistons are used with three rings all above the piston pin, while directly below the lowest ring there is an oil groove with oil return holes through the piston wall. The firing order



Right side of Lycoming 8-in-line engine, showing accessory drive shaft and water jacket cover



The eight-in-line Elcar sedan

which is 1-6-2-5-8-3-7-4, gives uniform spacing of explosions and reduces vibration to a minimum.

The crankpin bearings have no oil grooves, but the main bearings have short circumferential grooves extending to each side of the oil inlet. Lubrication for the connecting rod bearings is obtained by drilled holes through the crank arms from the main bearings.

Front end drive is by means of a Link Belt silent chain with spring supported idler pulley.

Valves are of  $1\frac{1}{8}$  in. clear diameter and have a lift of  $\frac{1}{8}$  in., the exhaust valves being Silchrome while the intake valves are chrome nickel steel. Tappets are provided with individual guides and the valve mechanism is lubricated from the crankcase through holes provided for that purpose.

The camshaft is carried on six bearings, the design being such that the camshaft assembly may be removed from the front of the engine. At the center of the camshaft there is a drive by means of helical gears to the ignition unit on top of the engine and to the oil pump in the crankcase.

At the front main bearing there is a special groove which connects with an

oil hole to the chain idler pulley bearings. There are a number of holes in the idler bearing which register with the oil hole, so that the chain gets four or five shots of oil during every revolution. Water circulation is by means of a centrifugal pump.

The intake manifold is of the Swan type with right angle bends to cause turbulence in the mixture. It is located above the exhaust manifold so as to take advantage of the heating effect of the exhaust gas.

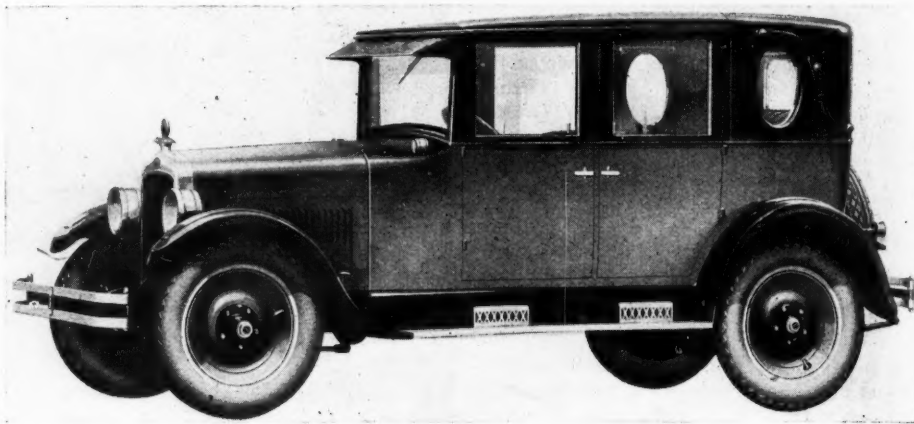
Servicing the power plant is facilitated by the construction used, in which the cylinder head may be detached from the cylinder block, making it a simple process to clean carbon or grind the valves. Disassembling the power plant is further simplified by having the cylinder block detachable from the crankcase.

On the side of the cylinder shown in the illustration the water jacket is cast open, this opening being closed by means of a pressed steel cover. This construction is of great help when jackets have become coated with lime or other deposits so that cooling is affected, for with one side accessible it is possible to scrape the surface to remove such deposits.

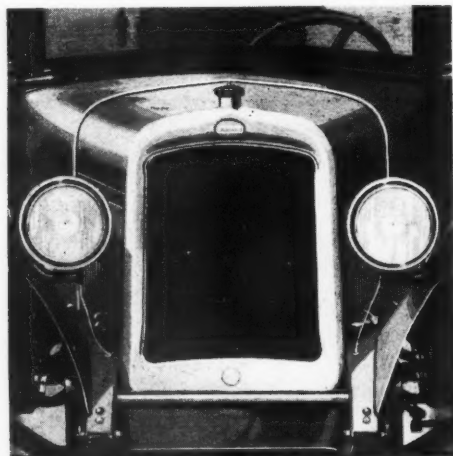
# New Body Type and Larger Engine Feature Late Series Oakland

**F**OR immediate release The Oakland Motor Car Co. is continuing its 6-54 line with a larger engine, improvements in chassis and bodies, and the addition of a new body model called the landau sedan. All models have 31 by 4.95 balloon tires as regular equipment and the closed bodies have the new Fisher VV one-piece sliding windshield. Prices on all models have been increased one hundred dollars.

The piston displacement of the engine has been raised to 185 cu. in. by increasing the cylinder bore from 2 $\frac{1}{8}$  to 2 $\frac{3}{8}$  in. and this change in conjunction with an increase in the rear axle reduction from 4.7 to 5 to 1 has greatly improved acceleration. The pistons are now of



Oakland Landau Sedan



Radiator is longer, crank passes through bottom of nickel shell instead of through apron as formerly and head lamp brace bar has been eliminated

semi-steel with three plain  $\frac{1}{8}$  in. rings all above the pin.

The transmission has been strengthened by increasing the face width of the constant mesh and intermediate gears from  $\frac{1}{8}$  to  $\frac{3}{8}$  in. and the ten spline  $1\frac{1}{4}$  in. mainshaft used formerly has been replaced with a six spline  $1\frac{1}{8}$  in. shaft.

An oil retainer has been added to the inside of the rear wheel roller bearing to prevent leakage at this point. The construction at the rear brakes has been simplified by increasing the length of the brake band lever and curving it backward which change eliminates two links formerly used at this point.

In the front axle, ball thrust bearings on the king pins have replaced the washers used previously. On the open models, the number of plates in the front springs has been increased and front snubbers are provided on the closed models to improve the riding qualities. The driving compartment has been enlarged to give increased leg room. The appearance of the car from the front has

been slightly changed by an increase in the length of the radiator shell and the elimination of the fender tie rod.

The new landau sedan is finished in Buckingham gray duco with red striping, nickel trimmings and black fenders. It has oval windows in the rear quarters and carriage irons. The upholstery is plush mohair to match the exterior finish. Accessory equipment includes double bar bumper in front, rear fender guards, nickel plated head and cowl lamps, dash gasoline gage, walnut mould-

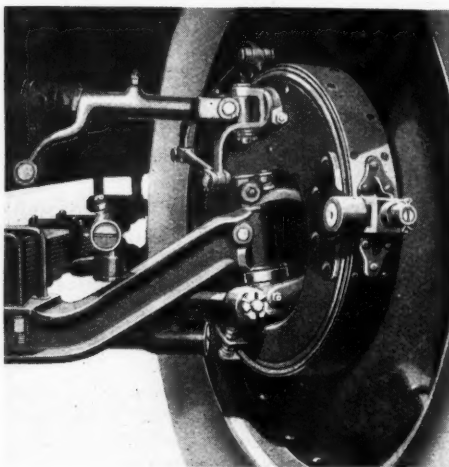
of those models has also been improved. Standard bodies are finished in Holland blue with white striping on body and wheels.

The new price schedule follows: chassis \$925, phaeton \$1095, roadster \$1095, special phaeton \$1195, special roadster \$1195, landau coupe \$1295, four-passenger coupe \$1495, sedan \$1545 and landau sedan \$1645.

## New Oldsmobile Announced

(Continued from page 18)

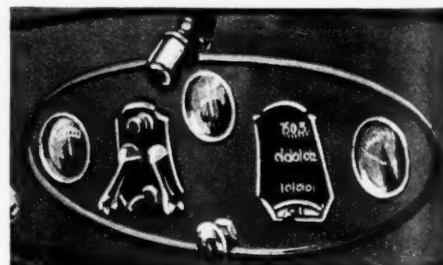
has been inserted in it. The heat control valve on the exhaust manifold must now be set manually as it is no longer interconnected with the throttle. The muffler tail pipe has been lengthened so that it discharges the rear of the car instead of under the body as formerly. Solid rubber bumpers have been placed over the front and rear axles to relieve the spring of heavy road shocks.



Front axle on Oakland which is now equipped with ball thrust bearings on the king pins

ings motometer with nicked wing cap, kick plates, rubber running board mats, nicked door handles, silk roller shades, dome light, heater and door locks.

On the special touring and roadster models, fender guards have replaced the full width rear bumper furnished formerly. These models are finished in Oakland blue with black striping. The closed models all have a new design of visor and an automatic windshield cleaner with control on the dash. The springing in the back and seat cushions



Close-up of the Oldsmobile instruments

The new price schedule is as follows:

Roadster .....	\$ 875
Sport roadster .....	985
Phaeton .....	875
Sport phaeton .....	1015
2 pass. business coupe .....	1045
4 pass. coupe .....	1175
Sedan .....	1250
De Luxe sedan .....	1350

Balloon tires with disk wheels are \$50 extra on the standard models. As the sport models are regularly equipped with disk wheels, the extra charge for balloon tires on them is \$25.

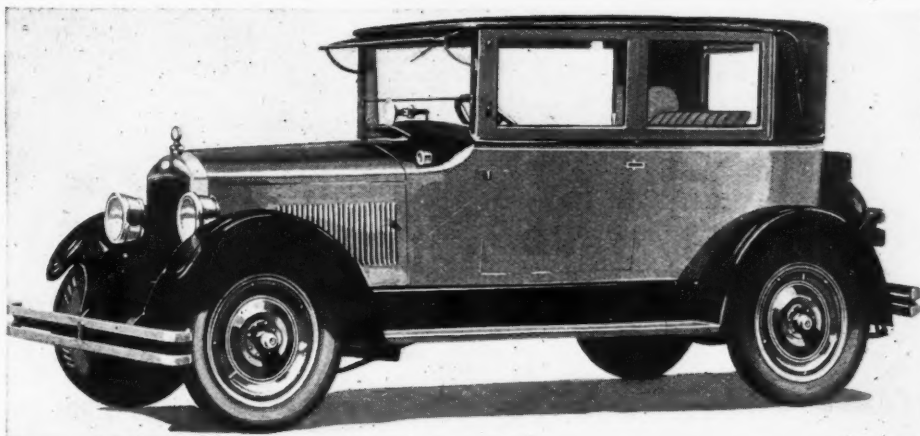


# Four Standard and Three De Luxe Models in Jewett Line

**T**HE Jewett line as announced by the Paige-Detroit Motor Car Co., will include four standard and three de luxe models, the latter including a new brougham. No changes have been made in the chassis, but balloon tires 32 by 4.95 are made standard equipment on all models and the company is offering new colors and color combinations in the various styles.

Prices on the entire line are as follows: Standard models, touring \$1,135, 3-pass. coupe \$1,310, 5-pass. brougham \$1,385, 5-pass. sedan \$1,545. De Luxe models, touring \$1,290, 5-pass. brougham \$1,525, and 5-pass. sedan \$1,745.

The touring car, coupe and sedan of the standard line are furnished in autumn green satin finish. The high lustre baked-on black enamel finish is continued on standard brougham. The touring car of the de luxe line is finished in lotus blue, the sedan in lotus and hathor blue, and the brougham in autumn green satin finish. Carriage irons and leathered



*The Jewett De Luxe brougham equipped with balloon tires and furnished in autumn green satin finish. The price is \$1525 f.o.b.*

back are introduced in the deluxe brougham.

Equipment of the de luxe models includes spare tire, tube and tire cover, trunk and rack, combination stop and

tail light, spring bar bumpers, motor-meter, cowl lights, windshield wiper, rear view mirror, sun visor and spotlight. Heaters are provided in the brougham and sedan models.

## Liability of Dealer Selling Car on Conditional Contract

**N**EW YORK state has a new law making the owner of an automobile liable for damages resulting from the operation of the car by any person with his consent whether upon the business of the owner or not. This has brought up the question of the liability of the dealer who sells a car on conditional sale retaining title until the car is fully paid for. The Empire State Automobile Merchants' Association recently expressed the opinion that such dealer, although technically the owner of the car, could not be held liable. In support of this belief the association has obtained a formal opinion for Oscar J. Brown, an attorney. Mr. Brown's opinion follows:

"The question as I understand it, which you are attempting to determine is whether or not a motor car dealer who has sold a car under a conditional contract of sale, which contract by its terms says that the title of the property shall remain in the seller until the purchase price is paid, is an owner under this section to the extent of being liable and responsible for damages as therein expressed. Unfortunately this question has never been raised either directly or by analogy in any cases in this state.

"My conclusion, however, after an exhaustive search of the law covering this subject is that the dealer is not such an owner and is not responsible in damages for accidents happening to cars so sold

by him and my reasons therefor are as follows:

"This law is in derogation of the common law. That is, it changes the rule of law which has heretofore existed. Under the common law the only person liable for injury was the person who was negligent or the person for whom he was acting. This new law creates liability where none before existed and as such it must be strictly construed, which would mean in this connection that it would be construed to take in just such persons as it was the clear intention of the Legislature to include and no others.

"The clear intention of the Legislature in enacting this law was to do away with the defense which is now interposed in many negligence actions, that the person operating the car at the time of accident was not operating the same upon the business of the owner. Such owner by the present law is made liable for the operation of his car by any person with his consent whether the operation is upon the business of the owner or otherwise. Such owner clearly is the person entitled to the actual, physical possession and management of the vehicle and can apply to no other person except by such a liberal interpretation of his law which is contrary to all the rules of interpretation of the statutes which are in derogation of the common law.

"For these reasons it is my opinion

that this statute creates no liability upon any automobile dealer who sells cars upon conditional sales contracts arising from that fact alone. That is, unless the dealer exercises some actual physical dominion over the car other than that authority granted him under his conditional contract of sale, I see no liability which may accrue against him under his statute."

### "FORD FACTS" IS ISSUED

DETROIT, Aug. 8.—A revised edition of the booklet "Fordex" or "Ford Facts" has been issued by the Sales Equipment Co. of this city. The new edition like the first is vest-pocket size. It contains the latest facts, figures and other information concerning the Ford Motor Co. its activities and its products. Ford cars and trucks, Fordson tractor and Lincoln motor cars are all generously treated.

### BOOK ON CHAIN DRIVES

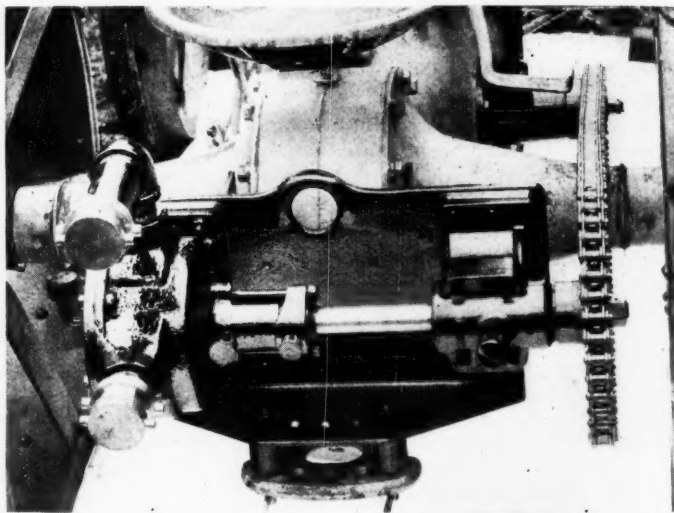
A text book on power transmission, and silent chain transmission in particular, has just been issued by the Ramsey Chain Co., Inc., Albany N. Y. It is a 6x9, 48 page book in two colors, illustrated and bound. It treats on the comparisons between the various methods of drives, leather and rubber belting, gearing, direct drives, and silent chain.



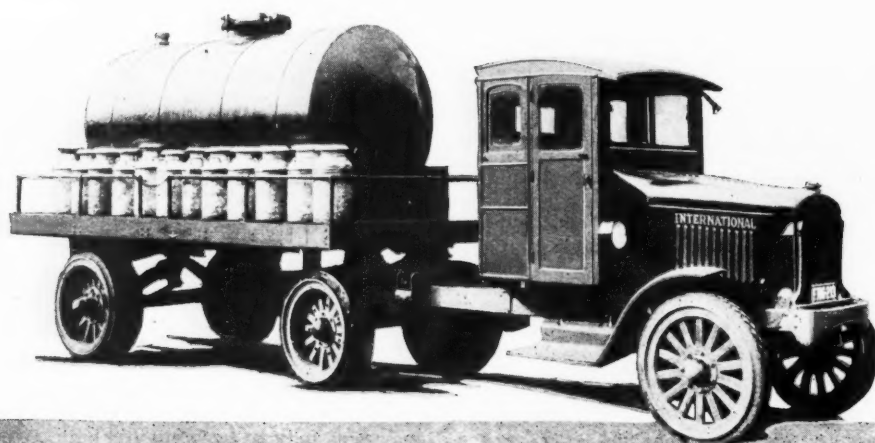
# MOTOR AGE'S PICTURE PAGES



Here is another demonstration of the usefulness of the motor truck. Each year a fleet of 21 Republics hauls 100,000 boxes, or 135 carloads, of apples over the mountains in Washington. Each trip 6 carloads are carried and the trucks travel over 33 miles of mountain highway, over grades of 18 per cent and a total elevation of 5,000 ft.



New and ingenious uses to Fordson owners are offered by a fire protective spraying and pumping unit which is attached to the rear of the tractor and is equipped with a number of attachments including a 120-gal. tank trailer which permits the owner to take his water supply with him when spraying trees or fighting fires. Above, a closeup of the unit

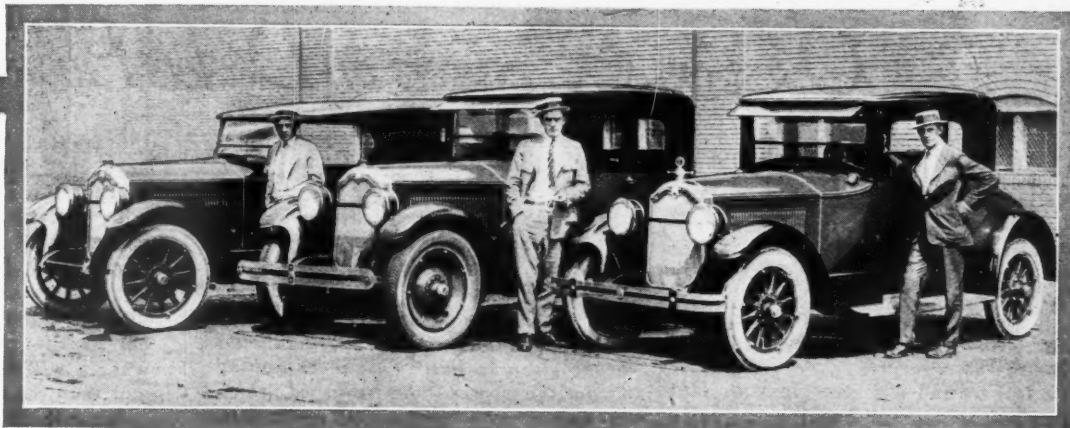


Detroit babies are efficiently served by this International motor truck and two-wheel tractor which is equipped with a 1500-gal. milk tank. Milk is brought to the city from within a radius of 30 miles each day



# OF AUTOMOTIVE INTEREST

The entire Boston Red Sox outfield owns Buicks, we learn. Wonder if they bought them to chase Babe Ruth's long distance ones with



A party of California tourists on a 582-mile run being regaled by Indians around the tribal camp fire. At the right a Leudinghaus 3½-ton truck with 3000-lb capacity power crane operated by the truck motor



A St. Louis bank boosts its business by bringing its customers to the bank





# The READERS' CLEARING HOUSE

## Questions & Answers on Dealers' Problems

### Common Law Lien Lost by Relinquishing Possession

Q.—I have a bill against a car for labor and parts, as well as oil and a few other small things. How can I collect this bill? If I can get the car in my garage for some other work to be done on it, can I demand my money and hold the car until the bill is paid. How about a tire that I supplied? —Pennsylvania Reader.

We fail to find a statute in your state giving you a lien for repairs and labor. Hence your lien at common law was lost when you gave up possession of the repaired car. This common law lien for repairs on personal property obtains where there is no lien given by the state's statutes. And this lien is one of possession only. To give up possession of a car held for repairs releases this lien. Since the lien is released or destroyed by returning property to its owner, you have no legal right to hold the car at another time for the same repairs should it again come into your possession.

The exception to the proposition that loss of possession by a repairman is loss of his lien occurs where the possession by the owner or his agent or another is obtained by fraud. Where fraud has been committed to obtain possession the repairman may regain possession by suit in replevin. But failure or promise to pay is not fraud unless it can be shown that the owner or other did not intend to pay and made representations to get possession of the car. For instance, should an owner call for his car and tell the repairman that he would drive to the bank and get money to pay the bill, then fail to do so, that would be fraud. And if he had no account at the bank with which to pay that would be additional proof of fraud.

But should you return a repaired car and take the owner's promise to pay at a later time, then you have extended credit and signify an intention not to claim a lien. Loss of possession under such circumstances is irretrievable.

Your common law lien covers repairs and labor only. Supplies and accessories, unless used in making the repairs do not come under the lien.

### FRONT END COLLISION MAY HAVE BENT STEERING COLUMN

Q. I would like to know how to set the steering gear on a 1924 Special-Six Studebaker. This had a wreck about three weeks ago and the axle was bent. We straightened the axle but now find that the steering gear is hard to turn and has a whip in it. By this we mean that if a corner is turned at above 10 miles per hour and the wheel is then let go of, the wheel will whip back straight while below 10 miles per hour it will not do this. This car should steer very easily so we would like to know what is wrong with it and the remedy. How do the tapered blocks

**The Readers' Clearing House**  
**THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.**

**All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.**

**Readers' names will not be published with articles, if a request to this effect is received with the letter.**

**Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.**

**Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.**

**Addresses of business firms will not be published in this department but will be supplied by letter.**

**Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.**

go between the spring and axle? Should the thin end be toward the front or rear? We would like also to know if there is a lock in the steering mechanism which prevents the front wheels from turning the steering wheel but allows the steering wheel to turn the front wheels. If there is such a lock it is not working on this car and we would like to know how to fix it.—Raymond R. Ward, 217½ 4th street, Parkersburg, W. Va.

The steering gear in question is known as the worm and wheel type and the basis of the irreversible feature is that the gear ratio between the worm and wheel is such that trying to operate the steering wheel by turning the front wheels involves overcoming a great deal of friction. It is something like pushing on a wood screw to make it turn around. If there were no friction this would be possible. The difficulty you are encountering is doubtless due to the accident which in addition to bending the front axle has probably put a strain in the steering gear and has without doubt bent the steering column. We would suggest having this gear thoroughly overhauled by the nearest Studebaker dealer. The block which goes between the spring and axle, is marked so as to show which is

the front and which is the rear. On most cars it is customary to set the axle so that the steering knuckle pin is not quite vertical, the upper end slanting back a slight amount. If the slant is too great it is difficult to make the car go around a corner and it straightens up very rapidly, while if the pin is vertical or the top end slants forward the wheels will tend to go to first one side and then the other and it will be difficult to hold them straight.

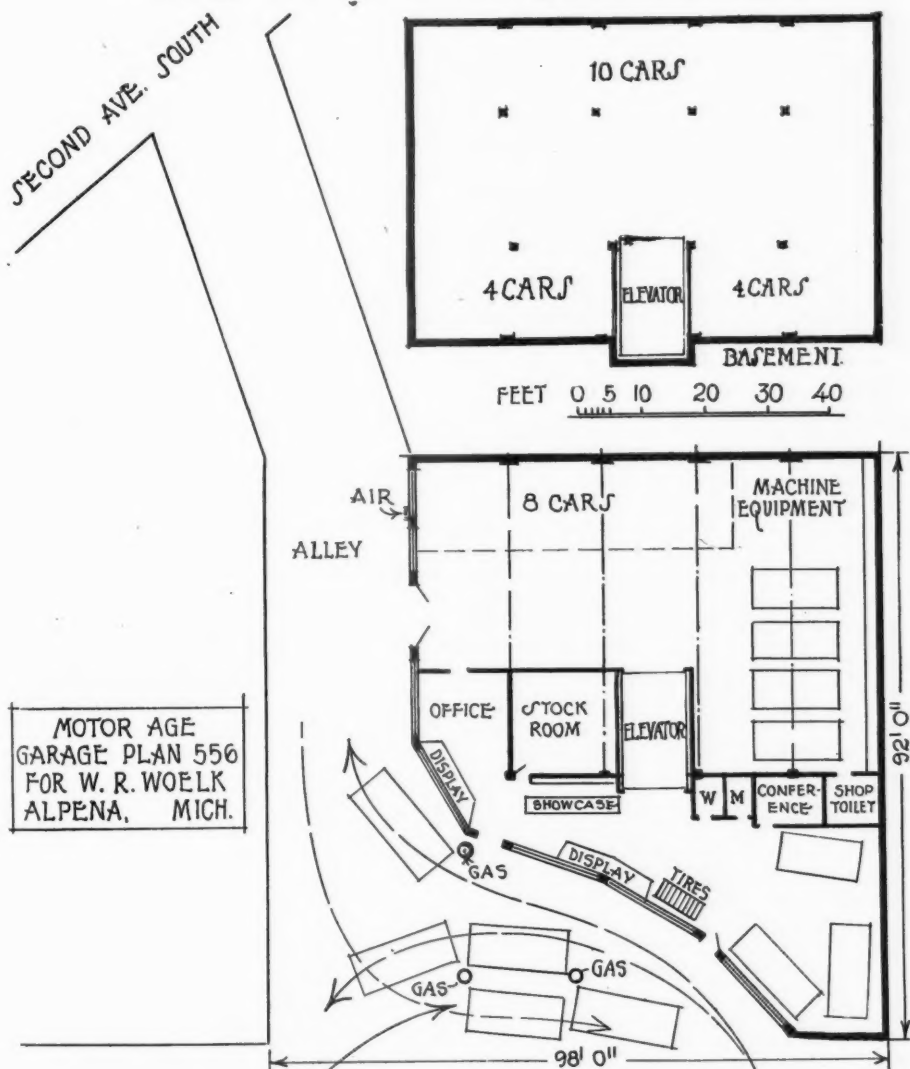
### ADVANCED SINGLE SPARK OR RETARDED DOUBLE SPARK CAUSES KNOCK

Q. We have a late 1909 Packard that has a knock that we are unable to locate. The cylinders have been reground and new light-weight alloy pistons installed. The crankshaft was reground and new bearings were fitted. The compression was raised ¼ in. and the flywheel cut off a little. The car has been run about 500 miles since putting in new parts. We pulled the pistons and examined them and also the connecting rod. Pistons are in good shape and the rods are in line and all bearings were within .0015 to .002 in. of being tight. Compression is good and we have checked valve and ignition timing and have found that the water pump is operating o. k. This motor has a new German Bosch double head magneto with two sets of spark plugs. Stromberg carburetor is used and we are using ethyl gasoline. This knock is not a ping or heavy thud, but sounds like two flat pieces of metal hitting together. With the magneto on single ignition and up to 35 m.p.h. the noise is not noticeable, but if we put on double ignition it will show it and the faster we go the louder the rapping becomes. If the spark is retarded on double ignition the rapping is worse while on single ignition it is worse with the spark advanced. There is no carbon in the motor and we wonder if weakened valve springs could cause this condition. The exhaust cam gear runs a little eccentric but we cannot see that this would account for the difficulty.—W. A. Hinkle, 2801 E. 7th street, Kansas City, Mo.

You do not say what clearance you allowed in fitting the pistons. It occurs to us that there is a peculiar combination of piston position and high explosion pressure obtained by advancing the spark when on single ignition or retarding it when on double ignition which is causing piston slap. Some of the alloy pistons, incorporating constant clearance construction are fitted rather close being a gentle push fit in the cylinder. In other cases where the constant clearance construction is not used it is necessary to allow more clearance than for cast iron. It would be well to get the recommendation of the piston manufacturer and compare this with the clearance used in fitting the pistons as from the description of the trouble it seems as if the pistons may be a little too loose in the cylinders so that they cause a knock under the condition described.



## Filling Station Cuts Up Front Badly



Q—Am sending you under separate cover blue print of a plot of land upon which I contemplate erecting a filling station of the drive type; which is to be the main factor and wish to incorporate in the same building an automobile salesroom and service station with approximately a 50x50 basement. I want incorporated in this a three-pump station, a washrack for automobiles, ladies' and gentlemen's rest-room, as well as one for the employees.

Will you please submit a tentative drawing incorporating the above mentioned features?—W. R. Woelk, Alpena, Mich.

The front of this building seems rather irregular because of the location of the gas pump, but everything considered we believe the arrangement is rather good and the cars in the show room are pretty well displayed. We have made the basement section the full width of the building because it would seem rather foolish to stop it at fifty feet since the extra twenty would not add considerably to the cost.

Columns are placed so that two cars may be placed between them thus insuring a maximum storage. The main body of the building, that is the garage part, is spanned by four trusses of fifty foot length which carry the roof. The forward part will have to be taken care of by rafters.

The elevator is built out into the unexcavated portion under the showroom, far enough so that it will not interfere with the aisle space in the basement.

Since there is no very good place for installing a doorway from the garage into the showroom it would be best to take cars to the showroom across the elevator having a doorway at the back of the elevator, or on the showroom side.

Although we have not shown one, it might be well to place a window in the rear end of the stock room so that it would be more handy for mechanics to get parts.

### Architectural Service

IN giving architectural advice, MOTOR AGE aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

## The Train Made the Flivver Lose Its Bearings

Q. We have just overhauled a 1920 Ford which ran all right for awhile but now it knocks. The work done included tightening of the main and connecting rod bearings, putting in new camshaft bearings, lapping in new pistons and new piston pins and rings in addition to other work. This car was hit by a train about a year ago. We also found that the lower crankcase was sprung and found that the connecting rod at the top hit the piston bushing. We removed this piston and forced the bushing out and filed it away a little, but didn't get all the knock. Could the crankshaft be sprung in such a way as to cause this condition? The new pistons were .0025 inch oversize and we had to work hard to get them in. We have done other Ford overhaul jobs in the same way but never had this trouble before.—Eldon McKibbin, Guthrie Center, Iowa.

It is possible that the crankshaft and camshaft and the crankcase, either one or all three of them are sprung. The crankshaft should be tested by placing the two end bearings on Vee blocks and using an indicator at the center main bearings while the crankshaft is turned. If the condition is bad it may be possible to put the crankshaft in a lathe and then check the center main bearing, but before doing this it would be well to see that the end main bearings are turning concentrically. The camshaft should be checked in similar manner. To check up the crankcase itself it is practically necessary to have jig of some sort perhaps similar to those put out by the larger tool companies. These are usually available in the large Ford shops. In addition to checking the crankshaft and camshaft for straightness the connection rods should be checked on an aligning gage. If this is done it should not be necessary to shorten up the piston pin bushings as you have done. To check the operation of the connecting rod in the piston it would be desirable to remove the bottom engine pan and have someone watch the action with a light while the engine is turned over by hand. In this way it can be seen whether the upper end of the connecting rod is moving back and forth and whether there is a tendency to strike the piston pin bushing or not. According to your statement the knock did not appear at first but showed up after the car had run awhile. This would seem to indicate a bent crankshaft or camshaft which due to the bend puts an abnormal strain on the bearings and rapidly wears them loose. If you find the main bearings, particularly the center one, to be quite loose it will be a very strong indication that the crankshaft is bent.

What departments are to be operated and how large it is expected to be.

Number of cars on sales floor.

Number of cars it is expected to garage.

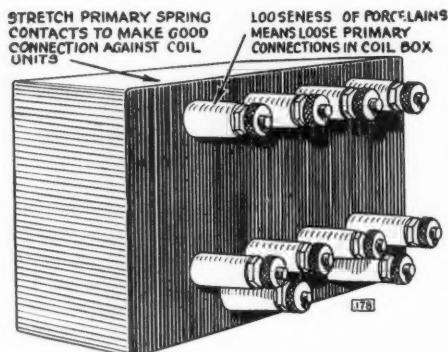
Number of men employed in repair shop.

How much of an accessory department is anticipated.

## Tuning Up a Ford for Idling

Q. I have noticed in recent model Fords there is a jumping as though one cylinder might not be functioning properly, but I have ground valves, adjusted coils with tester, set plug points .025 to .023 and still have the jumping at say from 6 to 10 m.p.h. I timed the valves according to piston travel, still all I have done doesn't seem to do any good. Tell me if there is anything you know of that has done any good in a case of this kind.—J. T. Henry's Garage, 304 Castle street, Wilmington, N. C.

We have the following tests. First test with a squirt can filled with gasoline the inlet manifold gaskets and all over the inlet manifold. If the engine speeds up or slow downs or has any change of speed when gasoline is squirted over the inlet manifold gaskets or over the inlet manifold itself, it indicates an air leak which should be cured either by installation of new gaskets or a new manifold. In some cases a hole will be found in the manifold and you have the choice of either buying a new manifold or welding



or brazing the hole in the old one. Our second suggestion is that you examine very carefully the timer roller to make sure that the roller arm itself does not strike the race-way.

The third suggestion is that you examine very carefully the primary connections on the coil box both inside and out. First look at the outside top primary connections and see that the porcelains are tight on the four top posts and on the magneto post. Then examine the springs on the inside of the coil box and pull them so as to give more tension against the coil unit.

Test the compression and see that it is even on all cylinders and if not either grind the valves or put in new rings as required. In case none of the above suggestions eliminate your trouble we would suggest that you send the carburetor to the nearest Ford dealer, who will change the idling well so as to give less gas at idling speed.

### SYMBOLS USED IN ARMATURE DIAGRAMS

Q.—In reference to armature winding, explain in detail the following symbols:

1. D. C. C.
2. Comm. Conn. R.
3. R of Sl.
4. L of Sl.

I am intending to take up winding of armatures and would like information

along this line.—Fred Martels, Economy Auto Service, Patchogue, N. Y.

D. C. C. means double cotton covered and refers to the insulation used on the wire. Comm. Conn. R. means commutator connected right, which refers to the relation of the top leads of the coil to the bottom leads. The symbol R, means that the top leads are to the right of the bottom leads, while the symbol L would mean that the top leads are to the left of the bottom leads. R of Sl means that a connection is made so many bars to the right of slot one and it is customary to begin counting with bar number one. In similar manner L of Sl means the number of bars to the left of slot number one, where a connection is made.

### 1914 MITCHELL OILING

Q.—Give explanation of the oiling system used in the engine of a 1914 Mitchell and show an illustration if possible.—A. F. Luciani, 351 Douglass Street, Indianapolis, Ind.

An illustration of the oiling system on the 1914 Mitchell is shown in accordance with your request. The lower part of the engine crankcase is divided into two main compartments, upper and lower. The lower compartment serves as a reservoir for an additional supply of oil for the engine. Within the left rear of the crankcase is located a plunger pump operated by an extra cam on the intake camshaft. This pump draws the oil from the reservoir through a fine screen and forces part of it through a pipe which runs along the outside of the motor to the crankcase, constantly keeping the gears in a bath of oil. From here the oil flows to the upper compartment of the lower half of the crankcase through the overflow pipe which opens into the lower compartment.

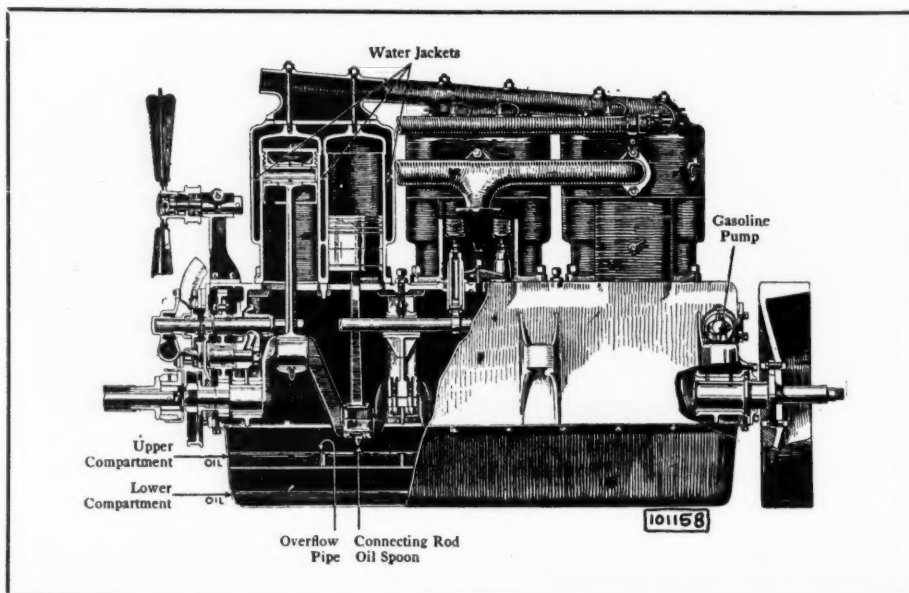
The overflow pipe is provided to maintain a constant oil level in the upper compartment. The other part of the oil forced by the pump flows through a pipe to a sight feed glass located on the instrument board, in this way the driver of the car can know at all times whether

the oil is feeding properly or not. From the sight feed glass the oil flows to the upper compartment of the lower crankcase and then back through the overflow pipe to the lower compartment. A small portion of the oil flowing from the sight feed glass is taken through a pipe so as to lubricate the clutch yoke.

### LEXINGTON AXLE ADJUSTMENT

Q.—We have a 1922 Lexington which has developed a hum in the rear end. The car runs quietly on the level at 25 to 30 miles per hour, but will hum when the speed is reduced. It also hums at 35 miles per hour going down hill unless the motor is pulling. Advise what adjustments this rear end has and give information which might be necessary to correct the trouble.—R. S., New Hampshire.

The trouble seems to be due to looseness between the ring gear and the pinion. The axle is of the conventional type in which the whole differential with ring gear can be moved to one side or the other after the inspection plate has been removed. At each side of the differential carrier there are two nuts, one of which acts as a lock nut. After the lock nut has been loosened the other two nuts may be turned so as to shift the ring gear one way or the other. For best results it is often considered desirable to remove the grease from the rear axle as much as possible and wash off the teeth of the gears so that they may be covered with paint. After an adjustment has been made it is then desirable to have the axle jacked up, the engine run with the car in gear and the brakes applied slightly so as to put a load on the ring gear and pinion. This rubs off the paint where the teeth are making contact. The contact should extend the full length of the teeth and should not be at one end only. The amount of back lash between the teeth should be very slight, only enough to make sure that the teeth are not binding. It is very rarely necessary to adjust the pinion but if this should be necessary it can be done by removing or adding shims at the front of the pinion housing.



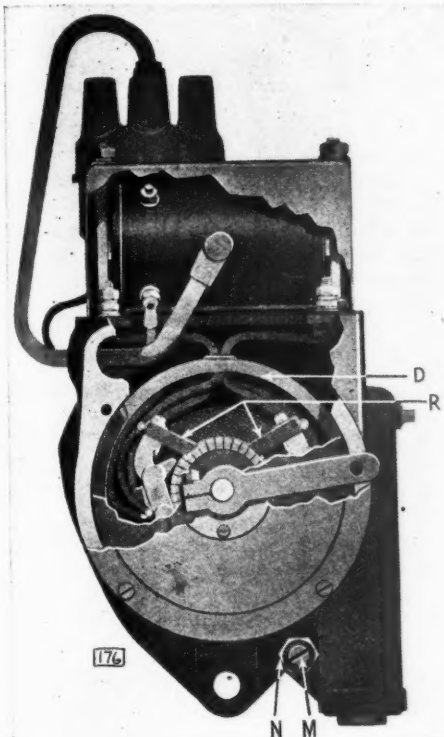


## When the Governor Hunts

Q.—We have several Moline universal tractors here on which the electric governor gives trouble. Motor will either shut down to very low speed or race beyond reason. Would appreciate remedy for this.—Van Buskirk Garage, Alta, Iowa.

Hunting or rapid governor actuation may be due to the wrong adjustment of the governor or to a derangement of it. The following information is taken from the instruction book supplied by the manufacturers of the tractor: To adjust the governor, have engine warm, then loosen nut (N) at Fig. 176, turn screw (M) in, then out four turns, place controller on position eight and then change quickly to position one.

If governor fluctuates up and down screw in until fluctuation is just elimi-



nated. This screw (M) controls the governor dash pot and if adjusting here does not eliminate the hunting, drain the dash pot, remove the lower plug, remove the upper plug, and wash dash pot out by pouring kerosene through it. This will remove any dirt that may be holding the flapper valve open or causing the piston to stick. Dash pot shown at Fig. 177, J, K and L. Replace lower plug and refill dash pot with engine oil.

Replace the upper plug and lift the control lever to see that the dash pot is full enough of oil to retard the opening of the throttle. After you have refilled dash pot, adjust, but not until after engine is warm and carbureter is known to be all right.

If such procedure does not eliminate the hunting, or rapid action of the governor, examine the carbureter control rods for lack of lubrication. If everything is O.K. on the carbureter controls, it indicates that the trouble is in the generator

and if you will write to us telling the action of the governor and the ammeter reading at the time we shall be able to give you more definite information.

## TURN THE CRANK AND THE STARTER WORKS

Q. We are having trouble with a 1920 Buick six, touring car which at times fails to start. When you turn on the ignition switch it shows a heavy discharge on the ammeter and the generator will not run as a motor and you cannot hear the overrunning clutch in the generator, and this also makes it impossible to press the starting pedal. Whenever this happens you can turn the engine over just a little bit with a crank and then the generator motors and everything seem to be all right. What is the trouble?—Wisconsin Reader.

On the insert between pages 16 and 17 in the Summer Service Issue of MOTOR AGE which was published May 15th, 1924, you will find a systematic method of shooting trouble of this nature. The chart in question refers to generator trouble but as the generator circuits are affected it will also apply to your case. We rather suspect that there is an open in the armature or a poor contact between the third brush and the armature so that current is not flowing through the field circuit. Accordingly the machine will not run as a motor. We think that the heavy current is current going through the armature circuit. We would suggest that the next time you have this thing happen that you take off one of the small wires at the side of the motor generator and flash it to the terminal from which it was removed. Do the same thing with the other wire. You should get a flash at each terminal with its respective wire. This will show that you have a circuit of some sort. We suspect that you will find an open circuit in the field and that it may be due to the third brush not touching the commutator. It is of course possible that there is a mechanical bind in the rotation of the armature which prevents it turning freely.

## WHEN THE ENGINE GOES UP IN THE AIR

Q. What are the correct internal settings for a model L4 Zenith carbureter used on a Continental model N engine, 3 1/2 by 5 used at an altitude of 10,000 feet?—Colorado Subscriber.

The Zenith data on this particular carbureter calls for a No. 19 choke, No. 95 main jet, No. 100 compensator jet, No. 45 idling well, and No. 38 seat. This considers average conditions, however, and may not be exactly right at the altitude of 10,000 feet. Permissible jet range with this carbureter, however, is from 85 to 95 on the main jet, from 90 to 105 on the compensator jet and either 19 or 20 choke. We would accordingly suggest that you cut down the size of the main and compensator jet somewhat for a trial, using at first a No. 19 choke, a No. 90 main jet, No. 95 compensator, No. 45 idling well and No. 38 seat. Then if the carbureter gives too rich a mixture you can use a No. 85 main jet and a No. 90 compensator, while if it gives too lean a mixture you can use a No. 95 main jet and a No. 100 compensator.

## Air Cooled Engine for Driving Generators May Need a Fan

Q. Advise make of magneto used on an old Flanders motorcycle, about 1910 or 1911 model. Where can parts be had for this magneto?

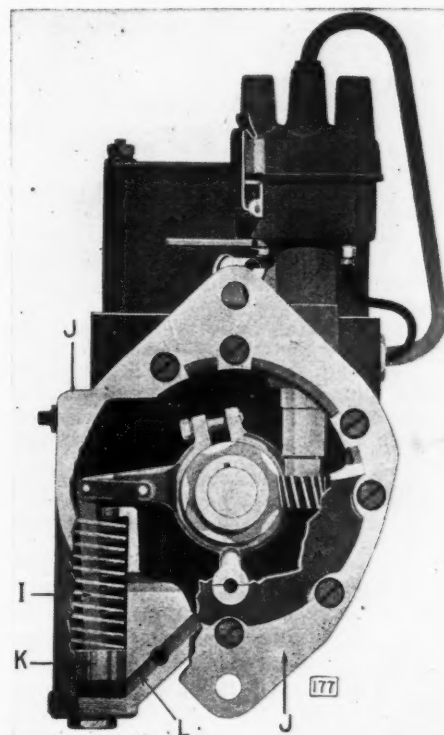
This was a Splitdorf magneto made by the Splitdorf Electrical Company, 392 High Street, Newark, N. J., and we assume that this concern can supply necessary parts.

Q. About what is the r.p.m. of this old Flanders engine? We intend using the motor to run two or three Ford generators, connecting up batteries for lighting as suggested by an article in the Readers' Clearing House recently. Any suggestions will be appreciated.

A speed of 1500 or 2000 r.p.m. will probably be about right. One thing we wish to call your attention to, however, is that in an air cooled machine operation is not so good when the engine is stationary. On the motorcycle cooling was obtained by motion of the engine through the air, but when this motion is not available, you may find that the engine runs hot.

Q. The old carbureter is of course obsolete, so we have installed a Ford carbureter. In your judgment is the capacity of this carbureter about right?—Geo. A. Cook, Langsdale, Miss.

The Ford carbureter is one inch size which is used on a number of motorcycles. Some very small engines have used a 3/4 inch carbureter but even if this had been original equipment we believe that the one inch would be satisfactory. We believe the most questionable part of your plan has to do with satisfactory cooling and it is possible that you can rig up a fan of some sort which will be driven by a belt and will help to cool off the engine.



## Generator Charges Only Half of the Battery

Q.—Can you furnish me with a wiring diagram for a Brisco 1915 or 1916 model, four cylinder. This car is equipped with a splitdorf apelco single unit 12 volt starter. The wiring has been tampered with and the generator charges only half of the battery.—Robert H. Ludington, 597½ Dundas Street, Woodstock, Ontario, Canada.

The wiring diagram that you request is shown and we are also publishing a wiring diagram which shows the internal circuits of the starting switch. It is quite likely that the trouble is in the starting switch rather than in the connections, although it would be possible to have the connections wrong. When the machine is operating as a generator the two halves of the battery are supposed to be connected in parallel, this connection being made in the starter switch. The A plus and B plus terminals of the battery should be connected and the A minus and B minus terminals should also be connected.

You will observe that the starting switch button which extends into the body of the switch carries two U-shaped members which are insulated from it. The one at the left is supposed to pull up a sort of flexible finger so as to make contact with an L-shaped bracket at the upper left-hand corner of the starter switch. This should make a connection through the bus bar shown by the dotted line so as to connect the A plus and B plus terminals.

There is one chance for your trouble if the connection is not made at this point. In similar manner there is a possibility that U-shaped member at the right is not closing the circuit properly. In some cases the bus bar shown dotted burns out which accounts for the trouble you are experiencing and in cases of this sort it is only necessary to make an outside connection which accomplishes the same purpose.

### DATA ON DU PONT

Q. We would like to know what year the model A Du Pont car was built. 1921 and 1922.

Q. What make motor was used and what was the brake horse power?

Specifications show that their own motor was used and that the S. A. E. horsepower was 19. Have no data on the brake horsepower.

Q. How many miles per hour will this car make in fourth speed?

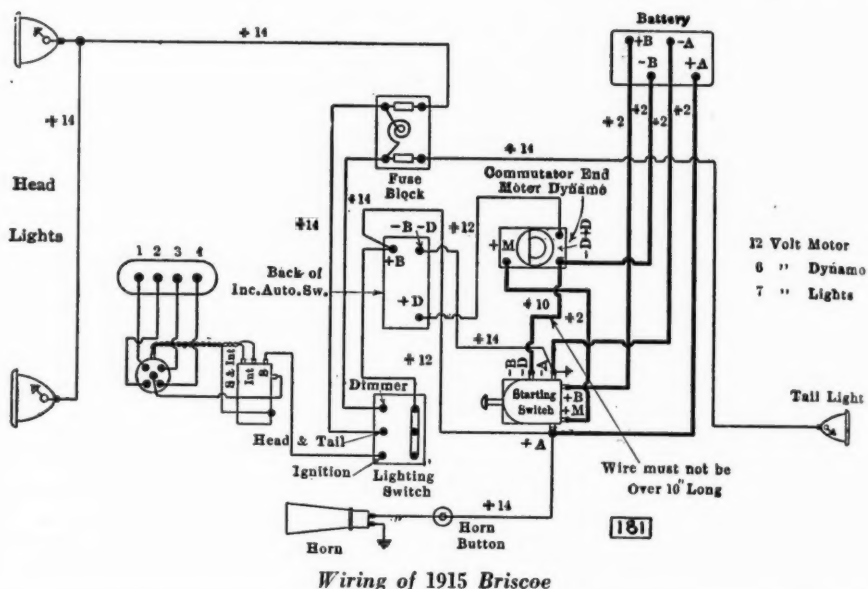
We would estimate it would go in excess of 60 miles per hour.

Q. Where can we get parts for this car?

This information will be given by letter.

Q. How many r.p.m. will this engine make and what is the gear ratio?—Gus Elgin, New Market Garage, New Market, Mo.

This information is not available, but you can determine the gear ratio by jacking up one rear wheel, putting the gear shift lever in direct or high, that is, third speed, assuming the fourth speed is overgeared and then turning the engine over with the crank. The engine should be turned until the wheel which is jacked



up has turned two complete revolutions. Then if you have had to turn the crank four revolutions it means that the gear ratio is 4 to 1.

### PISTON PINS IN "FAIR" CONDITION MAY CAUSE THE KNOCK

Q. We are having trouble with a Buick model D-45 that has developed a knock most noticeable at idling speeds. The bearings have been taken up, both main and connecting rod and the pins seem to be in fair condition. New timing gears have been installed and therefore it could not be coming from that source. Could the trouble be in the oil pump gears and the camshaft bearings or the front main bearings? These, however, seem to be in very good condition.—W. M. Pate, Hoberg, Mo.

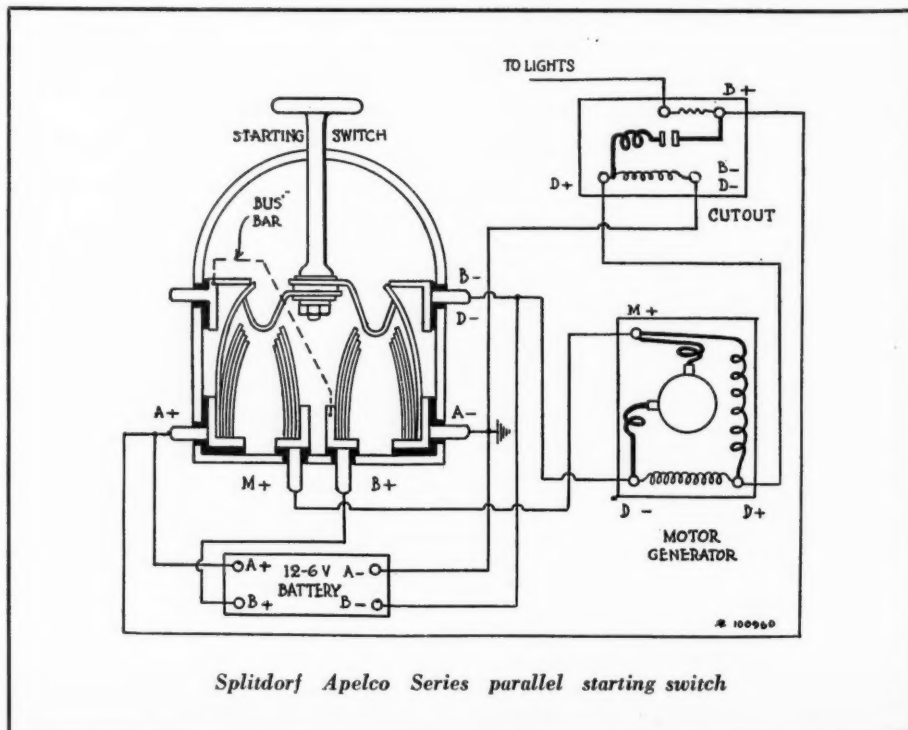
It is quite likely that the wrist pins are loose enough to cause a knock. You could test for this, however, by removing the spark plugs and putting about a

tablespoon full of 600W in each cylinder. This will have the effect of cushioning the piston-pin long enough to eliminate the knock for a short time. The practice should not be continued, of course, as this is done merely as a test to see whether the trouble is in the wrist pins or not.

### REVISED RACE CHART DATA

In the June 5, 1924 issue of MOTOR AGE, on page 12 it is stated that the "super-charger develops a pressure of about 2 to 2½ atmospheres" this should read "a pressure of 2 to 2½ pounds above atmospheric."

On page 14, same issue, in the specifications chart Duesenberg is listed as using Rudge Whitworth wire wheels on all models. This should read Dayton wire wheels on winning car.



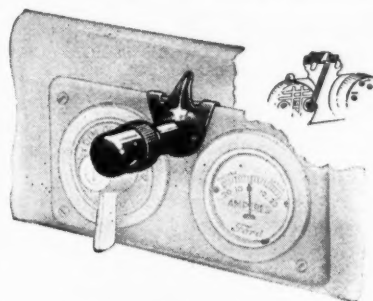


# BOOSTING ACCESSORY SALES

LAST week MOTOR AGE published on page 22 a letter entitled "This Man Has Seen the Light." If you haven't read this letter it will pay you to do so at once. Then read the descriptions that follow on this page. That will pay you, too.

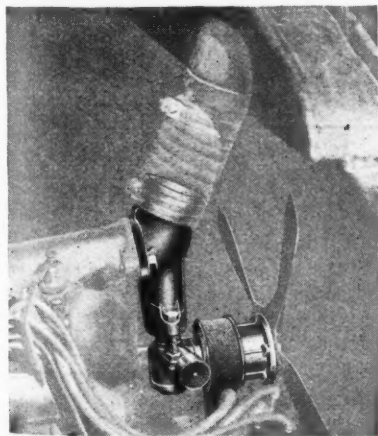
## Barnacle Dash Lamp

Ford owners will be interested in the "Barnacle" dash lamp made The Cincinnati-Victor Co., 712 Reading road, Cincinnati. The hood is drawn from heavy



Barnacle dash lamp

gage brass; a bracket clamps over the instrument plate and is held securely in place when the instrument screws are tightened. The switch is contained in the lamp itself and is operated by removing the hood about a quarter turn. The entire lamp is heavily nickel plated and highly polished. The list price is \$1.35 and it is known as No 20.



Water circulator for Fords

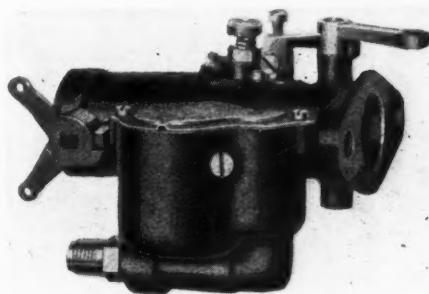
## Herbert Pump for Fords

This is a new type of Ford pump on which all moving parts run in a reservoir of grease. It is operated by the regular Ford fan belt, and a fan belt adjustment is provided to take up the slack and prevent slipping, but the arrangement is said to be such that the regular Ford method of circulation is not affected if the fan belt breaks. It is designed for year-around use on all Ford cars and trucks to prevent overheating in summer and freezing in win-

ter, and to make radiator refilling necessary less often by minimizing evaporation. The list price is \$7.50. It is made for and distributed by the Lathan Auto Supply Co. of San Francisco.

## Zenith Carbureter for Ford Replacement

Ford owners will be interested in the new Zenith replacement carbureter designed especially for this car. It is interchangeable with the standard Ford carbureter, having the same manifold, gas line, levers and stove. The new model is known as the HT3½F and is of the horizontal type with a ¾ in. barrel and a special Ford flange which bolts directly to the intake manifold. It is made in one piece, the barrel and bowl being a single casting, and the Zenith compound nozzle is retained, with, however, a new design of eap jet. Instead of the double float weights, a simplified float mechanism is



Carbureter for Ford replacement

used with a single lever hinged to the needle valve. It has a black lacquer finish over its rust-proof coating and can be installed on a Ford in about 10 minutes. It is made by the Zenith-Detroit Corp., Detroit, and sells for \$9.50.

## New Radio "B" Battery

Radio fans will be interested in a new "B" battery which is made by the Prest-O-Lite Co., Inc., Indianapolis, Ind. It is described by its maker as a "Super-Service" battery and is supplied in 24 and 48-volt sizes in 4,500 and 2,500 M. A. H.



"B" battery for radio fans

capacities for each, and is so constructed as to harmonize in appearance with fine furniture and radio sets. The cells are kept correctly spaced and protected from breakage by spacing panels at both top and bottom. The semi-hard rubber cell covers lock securely around the jars and plate lugs preventing seepage. The inside of the case is coated with an acid-proof preparation and as a further precaution the cell jars rest on a thick shock-absorbing pad containing an acid absorbing and neutralizing compound.

Extra precautions have been taken against short circuiting. In addition to the cell spacing, the cell connectors are elevated considerably above the top of the covers and widely spaced but the cells rest in the case at an angle to each other. The case is of oak finished in a dark color and rubber pads are provided to prevent marring of furniture.

## Special Ammeter for Use With Constant Potentials

A special ammeter known as the Compometer is being placed on the market by the Mann & Briggs Mfg. Co., 2135 Indiana avenue, Chicago. This device does not modify the constant potential system in any way but it is so arranged that it can be easily connected into the charging circuit of any one battery to see what current that battery is getting. At the upper end of the instrument is a heavy 100 ampere clip designed to attach to either bus bar. The wire formerly attached from the battery to the bar, is then connected to the lower terminal of the meter. The zero



The Compometer

point on the scale is in the center and readings up to 70 amperes are indicated each side of center.

A thoroughly discharged battery which is not badly sulphated, may draw as high as 70 amperes at the start, while a battery which is nearly charged may draw but an ampere or two. Without some instrument in the circuit of the individual battery, there is no way knowing this, except by possible heating which would occur in some cases. The need for an instrument of this sort is therefore quite apparent.

# GETTING MORE OUT of the SHOP

**R**EMOVAL of paint and cleaning grease from automobiles is the purpose of the Aloka Paint Removing Device Automatic Type No. 37. The manufacturer is the Aloka Chemical Corp., 5618 Harper avenue, Chicago, which provides a chemical to be used in conjunction with the device. The apparatus consists of a heater, a 50-gal. drum, a 100-lb. drum of chemical, three sections of pipe and fittings, two 25-ft. lengths of hose, one nozzle and one thermometer.

These devices are not sold, but are put in the shop on a lease plan. The total cost of installation and lease for one



*Aloka paint removing device*

year is \$200, with a charge of \$10 per year thereafter. The chemical comes in powdered form and is sold at a guaranteed price not to exceed 14 cents per pound f. o. b. Chicago.

In explaining the action of the chemical the manufacturer points out that it acts as a direct solvent for both vegetable and mineral oil and when applied to a painted surface dissolves the oil or binders thereby releasing the pigment which flows off without further aid; that the chemical goes into action at approximately 180 degrees and when applied to the surface acts for about 30 seconds; then as the temperature reduces another element takes action and neutralizes. The company also makes a solution for the purpose of removing baked enamel.

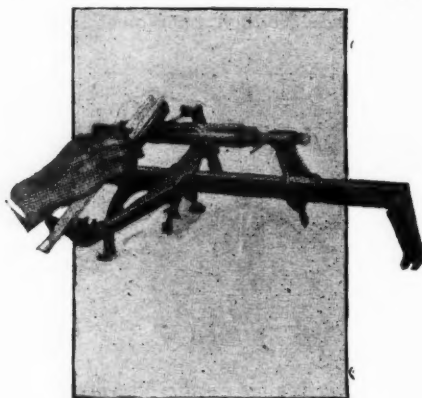
## Manley Low Type Jack

The Manley Low Type Jack is built on the same principle of operation as the Hi Speed Jack, both of which are made by

the Manley Manufacturing Co., York, Pa. The short stroke with the handle in the vertical position enables the jack to be operated in close quarters. The short stroke of the handle in the horizontal position makes it possible to use under overhanging bodies, under cars equipped with gas tanks, two tires at the rear, as well as the bumper. The steel-tired type sells for \$36; the rubber tired for \$47.

## Gundlach Reamer Stoning Tool

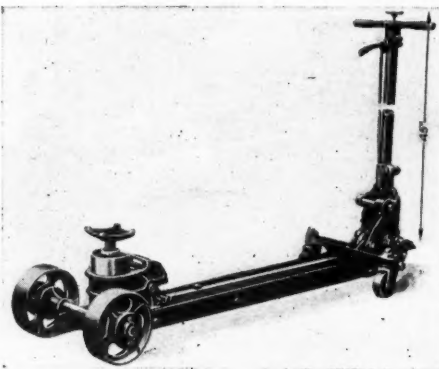
Accurate and uniform sharpening of reamer blades is the function of this tool. A reamer is held between centers as shown in the illustration. A tooth rest is mounted on a carriage on one side of the reamer, which prevents the reamer from turning. A rubbing stone is mounted in a holder, which has an ex-



*Gundlach reamer stoning tool*

tension. An adjustable rest upon which the extension of stone holder bears is mounted on the same carriage, opposite tooth rest. The carriage provides for an adjustment longitudinally for different lengths of reamers.

The tooth rest and hone extension rest are adjustable vertically, to take care of different diameters. The hone extension rest also controls the clearance or relief of reamer blade. The stone is rubbed crosswise of reamer blade by hand power. The tool is made by the Gundlach Machine Co., 408 East Main street, Belleville, Ill.

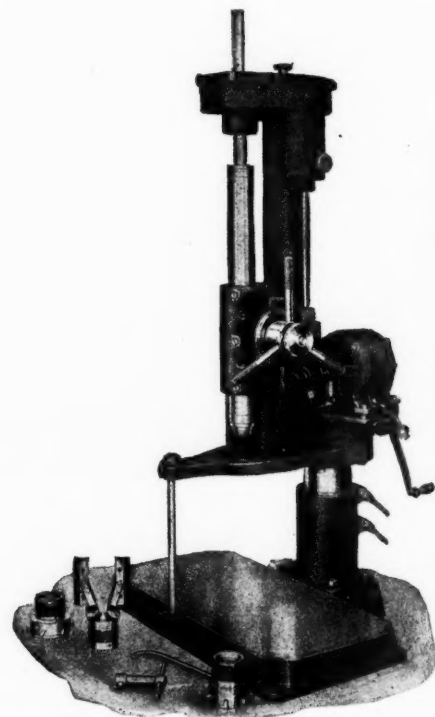


*Manley low type jack*

## Cincinnati Borhonizing Machine

A portable electric boring and honing machine is now being made by The John Steptoe Co., 2961 Colerain avenue, Cincinnati, O. The machine is operated by a ½ hp. motor, current being taken from a light socket.

This machine is designed to bore and hone cylinders from 2½ in. to 6 in. diameter to a depth of 15 in. The finished surface will have a mirror like



*Cincinnati borhonizing machine*

appearance, it is stated, and the machine is so constructed that it will handle cylinder blocks of all sizes and shapes, motorcycle blocks included. It is provided with a self centering boring head. The spindle is of steel measuring 1½ in. diameter, and the entire machine is of sturdy construction.

The total price of the machine on a "Pay for itself plan" is \$435; the cash price is \$400.

The machine is of the vertical spindle type. The time required to finish a four-cylinder block is 1 hr.; a six, 1½ hrs. and an eight, 2 hrs. Three spindle speeds are possible: 60, 85 and 350 for the operations of boring and honing. These speed changes can be obtained with the machine in operation.

## FLAT RATE CORRECTION

Attention is called to an error in the Flat Rate Schedules covering engine overhauling as listed on page 25, April 10, 1924 issue. Studebaker Operation No. 715, 87 hours should read, 77 hours.



# The Strain Invisible

Shock of High Voltage in Coils and Plugs, Like Vibration in Mechanical Parts, Makes Occasional Replacement a Wise Precaution

By A. H. PACKER

RACE cars, airplanes, heroes above the ground and on it, have contributed to the knowledge that makes motor cars safe and reliable. Theory helps and points the way, gathered from a fact here, a calculation there, it shows what may be expected in paths untrod. Defective parts that had served long and well.

What can the answer be? Men that crack under a strain, parts that crack after many revolutions, springs that break at the millionth bump, plugs that fail after miles of service, coils that puncture, point one way. Change and dissolution have their day. Call it crystallization if you like, a subtle change takes place which slowly weakens things mechanical and electrical.

Bend a piece of tin. Bend it again. The surface cracks and soon it breaks. Test a motor car spring. Back and forth the leaves are bent. Muscles of steel molecules stand the strain—for a time, but some day, some time, even steel gives way and replacement must come; but the wise man replaces the vital parts before disaster occurs.

So it was that in the war, airplane engines were changed in combat ships after 40 hours flight, bombing plane engines after 80 hours. These engines were then rebuilt, the usual requirements being new valves and piston rings. Other parts, however, were replaced which the casual mechanic would say were in fine condition. The crankshaft was one such part and here the microscope was often the only means of detecting a weakened condition of the shaft. Examining the highly polished bearing surfaces, it would be seen that fine cracks had started to form on the surface, which would eventually spread, resulting in a broken shaft and possible disaster. Thus would the crankshaft be changed after 100 hours as a precaution in protecting man and ship.

Not only did mechanical parts but electrical as well come in for their share of precautionary replacement, for electrical strain with a pressure of 5000 volts hammers at its restraining insulation even as the mechanical forces wear away the engine parts.

High voltage applies to ignition, of course, where coil insulation, spark plug insulators and layers of insulation in condensers are subject to heavy strains at each spark. Perhaps the most illusive trouble of an electrical nature to run to earth is the defective coil which is only slightly off color, so to speak. Compared with another coil which has not seen service it may appear to give on the bench test a spark that jumps as far and seems as hot, and sometimes substitution on the car or engine is required

to determine whether operation can be improved by a new coil.

Who can tell when a spring has sagged? If it is in bad shape it is easy to see. But who knows the exact instant when it sagged, or did it droop slowly, until a point was reached where there was no question about it. So with a coil. At the first test of coil or condenser its insulation will stand much more than it will later. Condensers at electrical factories are often given a tapering test. Tested at first on 900 volts, they are tested next at 800, later at 500, when in service the kick from the coil primary strains them the equivalent of 100 volts, and yet they break down after a time in service.

So with the coil insulation. It can not be seen to sag, but perhaps something of that sort takes place from an electrical standpoint, so that gradual weakening takes place like the sagging of the spring.

May there not then be times when ignition parts, plugs and coils can be a benefit to the car, suffering from general debility. Wartime aircraft have found it so and service men can follow in the trail they blazed.

## Universal Bulletins on Radio and Lighting Plant Batteries

The Universal Battery Company, 3410 S. LaSalle street, Chicago, has published a number of bulletins, any one of which may be had free on request. Bulletin No. 230 covers radio A and B batteries and gives essential points in connection with the care and charging of such batteries. It also describes methods of charging and gives diagrams where rectifiers of the bulb type, chemical type and vibrating type are used. It also shows method of charging when direct current is available and a resistance is needed in the circuit. Bulletin No. 85, also on the subject of radio batteries is more in the line of a catalog, listing not only batteries, but also radio B battery parts, charging clips, battery charges, hydrometers and other battery accessories. Bulletin No. 75 C is a catalog of lighting plant batteries and parts.

## CLAIMS CREDIT AS FIRST PNEUMATIC TIRE MAKER

Credit for making the first pneumatic tire is claimed for Dr. John B. Dunlop by the Dunlop Tire & Rubber Co., which was founded by Mr. Dunlop. The following account of the making of what is claimed to have been the first such tire appeared in a recent issue of the Dunlop Merchant News:

"Thirty-six years ago the 23rd of July, in Belfast, Ireland, the first pneumatic tire was born—it was a Dunlop.

"The first pneumatic was nothing more than an imperfect air bag made from surgeon's rubber and fastened to the rim of John Dunlop, Jr.'s tricycle with strips of cloth torn from an old dress belonging to Mrs. Dunlop. A rim of American elm was lashed on over the tricycle's iron wheel base to enable the cloth strips which bound the air bag on to be tacked down. Crude as this device was it started the tire industry on its way, and today the most modern tires embody to a refined degree that original idea of the Irish veterinarian, the principle of the outer casing and the inner tube.

"From that idea of John Dunlop's has grown one of the world's largest industries. Last year \$623,166,000 worth of tires were built and sold.

"One of the amusing incidents in connection with the first pneumatic tire is that the day it was born the first traffic cop came into being. On the first trial of the tires one of the Belfast policemen warned young John Dunlop that he was taking the corners too swiftly. The boy in exuberance over the increased speed of his air-filled tires indulged in the very human pastime of speeding. Even as you or I in our new gasoline chariot."

## Maintenance on the Installment Plan

(Continued from page 13)

jobbers. The business has been in operation for several months and the owners declare their losses have been negligible. The Flivver Shop has been particularly successful in attracting business because it operates on the 24-hour basis. Repairs may be obtained at any time, day or night, Sundays or holidays.

A member of the firm personally supervises progress on the repairs at all stages. It is customary to require a small down payment, usually about one-quarter or one-third of the total cost. This is required more as evidence of good faith than anything else. Satisfied customers is the chief aim. Every effort is made to please the customers even though it involves some expense to the house. If after a job has been turned out the firm learns that the customer has not been entirely satisfied, regardless of the time that has elapsed, a member of the firm calls on the patron and makes whatever adjustment is necessary. It is claimed that this has been one of the biggest factors in the success of the enterprise. Recently a plan providing for "10,000 mile maintenance service" was inaugurated. After an overhaul job has been done the customer is offered this service at a very nominal sum. It provides that whenever he sees fit he brings in the car for inspection and such minor adjustments as are necessary to keep the car in first class working order.

# EDITORIAL

## Remember the Early Bird

IT WAS predicted a few days ago that none of the objectionable bills bearing upon automotive propositions would likely be passed by this year's session of the Georgia legislature. Only a short while back it seemed the General Assembly at Atlanta was fairly deluged with measures of this sort. One and then another of the bills met death and there are strong chances that the session will pass into history without the enactment of a single measure vigorously opposed by automotive trade organizations.

The importance of this is expressed in the word "preparedness."

When the current session commenced the trade already had dug in and was standing by its guns. It had no special program of laws to be passed but it was well entrenched to combat a number of mischievous little bills that threatened the automotive trade with unfair impositions.

Killing the general run of such measures ordinarily is not a matter of hard campaigning, requiring usually the mere presentation of the automotive trade's side of the issue to legislators who without this representation are often influenced to vote for the whim of some member who does not give due consideration to all angles of the issue he brings into the forum.

Had no watch been maintained at Atlanta there is no telling how many of these half digested bills would have become laws. The watch was made doubly effective by early campaign preliminaries long preceeding the assembly's convocation. The Georgia trade, long before the session's opening, had a fairly good line on the measures of automotive interest contemplated, and the value of this information is obvious.

Here is a suggestion for trade organizations in other states, not busy along this line already. Next year there will be many legislative sessions and a large volume of automotive measures will be offered. Associations should be prepared to guard the interests of the trade. Smoke out these contemplated measures wherever possible early in the game and study their points. The old saw about the early bird certainly applies to the game of state legislation.

## An All-Time Tonic

AUTOMOBILE producers just now are basing output quite religiously upon the visible requirements of their retail agencies. They are playing the game close to the belt, so to phrase it. The prevailing policy of the more recent season has been studiously to avoid overloading or clogging dealer outlets.

Earlier in the year we witnessed a different condition. Production was overdone and it was highly speculative. Dealers felt the brunt of factory pressure to absorb stocks for which there was anything but a ready market. There were complaints in the retail field and there were some heavy liquidation losses. Manufacturers shared some of this deficit here and there through the medium of special concessions but the fact remains—the industry, with its various branches, lost money where a profit figure might as well have been noted on the other side of the ledger.

It is a tonic occasionally to be compelled to play the game tight and conservatively. Retrenchment is educational and the business that pulls through rough waters whole and sound

is always better off because of what it has learned through the experience.

Automobile producers are co-operating with retailers now in a manner refreshing to observe. Both maker and dealer seem to realize that they must pull together with a will. This spirit is typical of the trying or uncertain hour. It is the spirit that carries all concerned safely through the days of slack sales and depression and it is the spirit that causes large profits to become still greater in times of milk and honey.

When normal conditions are restored to the automotive industry we trust this fine co-operative fellowship will still exist.

## Co-operative Used Car Sales

TWENTY dealers in Washington, D. C., recently participated in a co-operative used car sale on a basis that was out of the ordinary. Results are reported to have been highly gratifying, many used cars being disposed of and floors thereby being well cleared of accumulations which it was highly desirable to move.

There is talk in the capital now of holding such sales periodically. The idea sounds like a good one for the Washington dealers.

And perhaps dealers in other centers would do well to give thought to co-operative used car sales. Every so often complaint is heard that one city or another is loaded to the guards with second hand vehicles and in such times especially the large well organized co-operative sale plan suggests fine possibilities.

The fact that it is easy for the prospect to shop in such a market, not having to go from one sales room to another, tends to speed up the co-operative groups' net delivery. The buyer, moreover, develops keener interest through the opportunity of making swift comparisons.

But in Washington's co-operative sale one rule was that each car offered should be a true bargain. This should be the rule in any case. That capturing public confidence in the event is very essential goes without saying.

## Bidding Against Himself

THIS story is told of a dealer representing two lines of cars and merchandising the respective lines in establishments considerably removed from each other. A buyer with an old car for trading played one of these sales places against the other, succeeding in getting a materially larger allowance at one place than he could have obtained at the other.

Here is a dealer who was bidding against himself if ever one did. His business system was faulty for permitting such a ridiculous prank against his organization. You might say he had a jolt coming to him and perhaps that is true.

But before giving that dealer too much of a laugh you, a member of the trade, might ask yourself if you do not frequently bid against yourself. Every dealer who makes an unreasonable allowance for a used car is guilty of this offense—just as guilty as the man who had the two sales establishments. With respect to the used car problem the trade is a unit and any undue lowering of allowance standards is generally harmful.



# Better Tone Is Shown in Production

## Slightly Upward Movements Suggest Improved Markets

### While Sales Have Not Hit High Stride Dealer Stocks Reveal Stronger Situation

NEW YORK, Aug. 18.—A slightly better tone is being given to automobile production the latter half of the month. The uptrend in manufacturing schedules is not great but bears witness to a steadily improving market and a continued forward movement in dealers' stocks which in some cases has virtually wiped out surpluses.

Sales volume has not developed to a high point and spottiness still marks demand throughout the country. Sales, likewise, are not uniform among the different makes of cars. There is a somewhat improved demand from agricultural centers but this is not yet so marked as to warrant a sharp stepping up in production programs.

Stimulus to sales has been given through the introduction of the 1925 models of cars. Most of the manufacturers planning changes in design have made their announcements and have placed new models in dealers' salesrooms. This has done away with much hesitancy on the part of the prospective buyer and has prepared the stage for what dealers look forward to be a fall season on a par with other years.

Some manufacturers report that dealers are gradually increasing their orders. Regardless of the fact that in instances there are no surplus stocks, manufacturers will make no effort to force cars on the trade and plan to adhere to this policy for the remaining months of the year at least. Actual consumer demand will govern manufacturing operations and surplus stocks will be avoided.

### Greater Optimism

Greater optimism pervades the industry as a result of improved retail conditions the feeling that the improvement will become more extensive with the entrance of new buying factors into the market. Should the agricultural situation develop to any extent, it will result in bringing the final quarter of the year so far beyond the expectations now held out for it.

The estimated July production of 258,200 cars and trucks is 5.3 per cent more than the June figure and brings the total output for the seven months of this year to 2,256,328 as compared with 2,359,238 for the corresponding period of 1923. During the seven months of 1924 a total of 2,039,702 passenger cars were produced as against 2,128,369 in the like period a year ago. The truck output for the seven months of this year amounted to 216,626, compared with 230,869 last year.

## Dollar a Mile Is Speeding Rate

HARTFORD, Conn., Aug. 18.—One dollar a mile is the fine assessed by the judge of Middletown police court on speeders within the city limits.

One offender who testified he was in a hurry to join his family at the shore in Westbrook was alleged to have been making forty miles per hour on Durham avenue.

"Forty dollars," said the judge. Another offender was traveling, so it is alleged, at the comfortable gait of 38 miles per hour and he was assessed accordingly.

## Lack of Interest Reason For Discontinuing Laboratories

CHICAGO, Aug. 18.—The Automotive Testing Laboratory, launched April 1, as a division of the Chicago Automobile Trade Association, has been discontinued, according to a formal announcement issued by the association. The laboratory was established for the purpose of testing, approving and tagging used cars for members. Explaining the decision the official announcement says:

"While it had great merit and could have been used to advantage by the members in the sale of used cars there seems to be a lack of interest and support in the proposition which justified its discontinuance."

### TO REOPEN SEPT. 15

MOLINE, Ill., Aug. 18.—The Starkweather Snook corporation, manufacturers of S. & S. shock absorbers, which has shut down temporarily is expected to be going full blast about Sept. 15, according to G. A. Starkweather, president. New style bushing and knuckle joint used on the newest model of shock absorber of this company has met complete approval of many car agencies, and orders are supplied at the present time from the stock on hand.

### SCHAEFFER QUIT ROAMER

KALAMAZOO, Mich., Aug. 18.—I. F. Schaeffer has resigned as vice-president and general manager of the Roamer Motor Car Co. His future plans have not been announced.

### BUYS BUICK AGENCY INTEREST

BETHANY, Mo., Aug. 18.—I. W. Maple of Bethany, has purchased the half interests of Laurance M. Crossan in the Buick and Oakland agencies here. Allen E. Dale is the other member of the firm.

## Equipments to Have Bigger Inning at National Shows

### Make Special Plans for Parts and Accessory Displays at N. Y. and Chicago

NEW YORK, Aug. 18.—The management of the national shows in New York and Chicago, in stressing the importance of the parts and accessory exhibits, is making plans to give the equipment end of the industry a greater opportunity than ever before to display its wares. With this end in view, changes are being made in both the Bronx Armory in New York and the Coliseum in Chicago that will aid materially in bringing this about.

Conferences between S. A. Miles, N. A. C. C. show manager, and Neal Adair, manager of the show department of the Motor and Accessory Manufacturers Association, have been followed by the announcement that the Chicago show will see a big rehabilitation so far as the equipment exhibit are concerned. The Coliseum gallery is being reconstructed on the Wabash avenue side, the second floor of the South Hall (the old Annex) is being completely redecorated, while in the new North Hall the gallery will be given over to parts and accessories.

### More Elbow Room

As a result of the changes in the Coliseum gallery there will be a height of seven feet at the rear, which will mean for greater comfort for exhibitors who in the past have been cramped by what might be called a low ceiling. The New North Hall will have 103 feet frontage on Wabash avenue, running back 167 feet and around three sides will be a gallery topped by a level roof with 13½ feet head room above all exhibits. An aisle will go around the gallery, with exhibit spaces on either side. Parts and accessory exhibit floors of the North Hall, Coliseum and South Hall will be connected on one level, making it possible for the show crowds to make a complete circuit.

Arrangements have been made to erect illuminated signs on the main floors where cars will be exhibited, pointing the way to the parts and accessory exhibits.

In the Bronx Armory, New York, all the parts and accessory space will be on the main floor with the cars.

### 122 CU. IN. RULE LIKELY

PARIS, Aug. 18.—In all probability Europe will face next year with 122 cubic inch cars having a minimum weight limit of 1,433 pounds. A meeting to decide on the racing policy will be held in Paris in Oct., and although there is a current of opinion in favor of dropping to 91 inches, the majority hold the view that the present rule should be maintained for another year.

## Association Managers See Good Business Period Ahead

### Sentiment of Atlantic City Meeting Favors Reduction of Associate Dealers in Cities

ATLANTIC CITY, N. J., Aug. 18.—Managers of more than 20 automobile dealers' associations from large distribution centers who were in convention here reported steady though slight improvement in business conditions in their territories, and forecast good business in the fall and in 1925. The association men were attending the annual summer meeting of the National Association of Automobile Show and Association Managers.

Sentiment of the meeting was strongly in favor of cutting down the number of associate, or community, dealers in cities. The managers generally reported that distributors and dealers in their territories were operating on restricted profits because of over-population of the dealer field.

The convention exchanged ideas on association and show management, and developed plans for show promotion work for the coming season.

The show men generally approved the decision to open the New York and Chicago shows with two days of exclusive trade attendance.

The new secretary-treasurer of the Association, A. V. Comings, editor of Motor World, was installed. The members presented a large silver platter to Neal G. Adair, who retired from the secretary-treasurership on becoming manager of the show department of the Motor and Accessory Manufacturers' Association.

## Creditors Vote to Continue Bay State Car Production

BOSTON, Aug. 18.—The Bay State car is to be continued in production contingent upon court approval, under a plan worked out by the creditors of all the R. H. Long Companies. It was voted to form a corporation to take control of the affairs of the companies and under the plan of a three years extension of credit operate them, paying off one-third of the indebtedness each year.

The creditors will have control but working with them will be R. H. Long, and some of the others identified with the company. This plan will be placed before the court that appointed a receiver some time ago under which the companies were being operated. Guy D. Murchie, receiver, will make his report and then the plan will have to be approved by the court. It is believed that it will be acted upon favorably because the creditors see in this move a chance to prevent the R. H. Long Companies from going into bankruptcy. Meanwhile the Luxor Cab Company has taken over part of one of the Long factories for building taxicabs.

## Half Year Net for General Motors Corporation Much Under Corresponding Period of Last Year

### Sharp Drop in Earnings for Six-Month Period Attributed to Second Quarter, When Demand Failed to Meet Expectations

NEW YORK, Aug. 18.—In the first half of the present year net earnings, after taxes, totaled \$27,066,990 in comparison with \$41,585,601 in the corresponding period of 1923, the General Motors Corp. reports. The sharp decline is attributed to the second quarter of this year, due, it is asserted, to demand not coming up to anticipations. With the first quarter netting \$19,400,957 as compared with \$19,406,123 in the first three months of 1923, it looked as if 1924 would be another banner season. The decline of the second quarter from \$22,179,478 in the same time last year to \$7,666,033 brought about the reported results.

As a result of operations in the first half General Motors shows a surplus available for dividends of \$27,066,990. The regular quarterly dividends on the debenture and preferred stocks, requiring \$3,462,160, were paid, after which there remained for the common stock \$23,604,830, or the equivalent of \$1.14 per share on the 20,646,337 shares outstanding. Two quarterly dividends each of 30 cents a share on the common stock were paid, totalling \$12,386,164, leaving a balance of \$11,218,666 carried to surplus account from earnings.

If the corporation's statement of earnings reflected the earnings of Fisher Body and General Motors Acceptance Corp. outside of the dividends received, the amount earned on General Motors

common for the first half would be \$28,600,701, equivalent to \$1.39 a share and comparable with \$2.18 last year.

### Drop Explained

In explanation of the drop, the corporation states:

The corporation's policy of manufacturing cars during the winter months in quantities to meet the contemplated spring demand was followed during the past winter, but due to the general business recession which developed, the sale of cars by dealers and distributors to consumers this spring was below the estimated demand so that production was curtailed during the second quarter in order that stocks of cars on hand, including cars in the hands of dealers and distributors, could be more quickly reduced to normal; this accounts for the sharp reduction in earnings for the second quarter as compared with the first quarter of this year.

While substantial progress has been made in reducing stocks, curtailed production is being continued during the third quarter in an effort to establish permanently healthy and sound conditions in the industry and particularly among dealers and distributors; the extent of this curtailment will necessarily depend on the demand for and sale of cars to consumers, which no doubt will be governed by general business conditions existing during this period.

Net earnings available for common stock dividends for the first six months show \$23,604,830, or within \$1,170,774 of the \$24,775,604 required for the full year's dividend on the common stock.

Quarterly sales and profits and also sales to consumers follow:

YEAR 1924			
	First Quarter	Second Quarter	First Six Months
Retail deliveries to consumers—cars and trucks..	139,148	240,442	379,590
General Motors Corp. sales to dealers—cars and trucks .....	215,550	137,549	353,099
Net earnings (after taxes).....	\$19,400,957	\$7,666,033	\$27,066,990
Amount earned on common stock.....	\$17,669,887	\$5,934,943	\$23,604,830

YEAR 1923			
	First Quarter	Second Quarter	First Six Months
Retail deliveries by dealers to consumers—cars and trucks .....	146,049	262,936	408,985
General Motors Corp. sales to dealers—cars and trucks .....	176,258	220,923	397,181
Net earnings (after taxes).....	\$19,406,123	\$22,179,478	\$41,585,601
Amount earned on common stock.....	\$17,704,199	\$20,475,305	\$38,179,504

The condensed consolidated income account shows net sales of \$314,426,673 in the first half as against \$362,819,353 in the corresponding period last year, representing retail deliveries by dealers of 379,590 units and General Motors sales

to dealers of 353,099. This compares with 408,985 and 397,181 last year.

Net profits from operations and investments for the first half totaled \$33,311,135 as against \$51,106,139.

### UNDER NEW FIRM STYLE

BOSTON, Aug. 18.—The Universal Auto Cover Company will hereafter be known as the Auto Spring Protector Company. There has been no change in personnel

and the company, which is located at 330 Newbury Street, will manufacture slip covers, tire covers, and hood and radiator covers, with its spring protector as the leader of its line.



## July Output 5.3 Per Cent Over June, Estimates N. A. C. C.

**Figures Show Production of 258,200  
Cars and Trucks Against  
328,063 Year Ago**

NEW YORK, Aug. 18.—Estimates of July production, based on shipping returns, made by the National Automobile Chamber of Commerce, show an increase of 5.3 per cent over June. Figures for the month just ended report production of 258,200 cars and trucks, as compared with 328,063 in July of last year.

The following table gives the car and truck statistics for the first seven months of 1923 and 1924:

	OUTPUT	
	1924	1923
January	316,278	243,554
February	367,527	276,955
March	382,474	355,073
April	373,201	382,746
May	312,858	394,190
June	245,790	378,575
July	258,200	328,063

Factory output for the other months of 1923 and 1922 follow:

	OUTPUT	
	1923	1922
August	345,271	274,200
September	327,506	207,206
October	365,162	239,406
November	312,906	237,329
December	303,201	228,410

Motor vehicle production segregated as to cars and trucks is as follows:

	—1923—	
	Cars	Trucks
January	223,822	19,732
February	254,782	22,173
March	319,789	35,284
April	344,661	38,085
May	350,460	43,730
June	337,442	41,173
July	297,413	30,692
August	314,431	30,872
September	298,904	28,578
October	335,041	30,139
November	284,939	28,073
December	275,472	27,762

	—1924—	
	Cars	Trucks
January	287,353	28,925
February	336,374	31,153
March	348,356	34,118
April	337,045	36,156
May	279,447	33,411
June	217,927	27,863
*July	233,000	25,000

\* Estimated.

### PROSPECTS BRIGHTER

MILWAUKEE, Aug. 18.—Prospects for passenger car business during August are materially brighter particularly in view of the fact that the bulk of new models and types will have been disclosed before long. It has been demonstrated again this year that anticipation of new cars has retarded retail sales. Those makers who came out about July 1 with new stuff had no difficulty improving their sales in July in comparison with June or May; others as a rule experienced some falling off, especially in cases where a dealer was unable or had orders not to admit that his factory was coming out with something new.

### HEADS CLYMER CO.

ROCKFORD, Ill., Aug. 18.—Frank G. Hogland, president of the National Lock Company, has been made president of the Clymer Manufacturing Company, recently incorporated with \$600,000 capital. It will manufacture "through-the-wind-shield" spot lights, similar to those of the National Lock.

## All But One Willys-Knight Model Advanced \$100 in Price

TOLEDO, Aug. 18.—All models of Willys-Knight cars are advanced \$100 in price with the exception of the coupe model, which lists \$30 above the former price, it was announced by the Willys-Overland, Inc.

The following tables show the old and new schedule:

	"64"	
	Old Price	New Price
2-pass. roadster	\$1175	\$1275
5-pass. touring	1195	1295
3-pass. coupe	1740	1770
5-pass. sport sedan	1695	1795
4-pass. coupe sedan	1450	1550
5-pass. coupe sedan	1550	1650
5-pass. sedan de luxe	1895	1995

	"67"	
	Old Price	New Price
7-pass. touring	\$1325	\$1425
7-pass. sedan	1995	2095

## Haugdahl Smashes Iowa's Mile Record at Davenport

DAVENPORT, Ia., August 18.—Sid Haugdahl, Norwegian driving ace, shattered the Iowa state mile record here in his Wisconsin Special, and clipped two seconds off the Mississippi Valley track record.

Hampered by a sticky and dangerously slippery track, Haugdahl swung around the oval twice at almost a mile-a-minute clip, setting the record of 1:02 which is two-fifths less than the former state record established at Des Moines state fair last year.

The Norwegian was slowed slightly at the curves on the first lap, but disregarded all precaution on the second lap which he negotiated in 29 seconds flat.

Besides lowering the two records, Haugdahl captured two other events of the opening day card of the fair. The Norwegian drove a Fiat except in his exhibition of record breaking.

### REJOINS WRENCH COMPANY

CHICAGO, Aug. 18.—John Craig has rejoined the staff of Walden-Worcester, Inc., of Worcester, Mass., and will travel Minnesota, the Dakotas, Wisconsin and points in Illinois and Michigan in the interests of Walde-Worcester wrenches. His headquarters will be in the Monadnock building, Chicago.

### DEALER FOR NASH

CHARLOTTE, N. C., Aug. 18.—The Burwell-Harris Company, Nash distributors, has added the Laney-Gordon Motor Company of Monroe to its list of dealers.

## Seven Months Sales by G. M. C. Dealers Are Off 7.7 Per Cent

**Monthly Report Shows Total of  
435,366 for Period Tabulated  
as Against 473,194**

NEW YORK, Aug. 18.—Retail sales by dealers handling General Motor cars are down 7.7 per cent for the first seven months of this year in comparison with the same period in 1923, according to the monthly report issued from headquarters here, the totals being 435,366 as against 473,194.

The report shows that General Motors is following its established policy of not overloading its dealers for in July deliveries to consumers totalled 55,776, while cars accepted by the dealers totalled but 40,797. This is below the June figures of 66,146 to consumers, but production evidently was speeded up some, for deliveries to dealers in July exceeded June's 32,984.

The report for the first seven months of 1924 and the corresponding period in 1923 and 1922 is as follows:

	—1924—	
	Sales to Dealers	Retail Sales
January	61,398	33,295
February	78,668	50,098
March	75,484	55,845
April	58,600	89,610
May	45,965	84,686
June	32,984	66,146
July	40,797	55,776
Total	393,896	435,366

	—1923—	
	Sales to Dealers	Retail Sales
January	49,162	30,464
February	55,427	41,448
March	71,669	74,137
April	75,822	97,607
May	75,393	89,317
June	69,708	75,952
July	51,634	63,209
Total	448,815	472,194

	—1922—	
	Sales to Dealers	Retail Sales
January	16,088	11,520
February	20,369	14,795
March	34,082	29,615
April	40,474	48,353
May	46,736	51,983
June	48,541	47,058
July	33,772	32,000
Total	240,562	235,324

### CHANDLER NAMES DEALERS

CLEVELAND, O., Aug. 18.—The Chandler Motor Car Co. announces the following dealers: George Hammond, Spangler, Pa.; D. W. Roberts, Long Beach, Cal.; Jackson & Kedzie Motor Service Co., 3206 W. Jackson boulevard, Chicago, Ill.; R. L. Culp Motor Co., Vandergrift, Pa.; J. W. Birmingham & Son, Jackson, Tenn.

### MACK BRANCH AT SCRANTON

SCRANTON, Pa., Aug. 8.—Continuing its policy of direct factory representation, the International Motor Co. has opened a Mack branch here in charge of G. A. Dams, a Mack dealer here since 1916. This is the company's 88th branch.

## Wisconsin Motor Show at State Fair Is Called Off

**Demand of \$40,000 Rental Instead of \$4,000 As in Past Basis of Disagreement**

MILWAUKEE, Wis., Aug. 18.—The ninth annual Wisconsin automobile show at the State Fair in Milwaukee, scheduled for Aug. 24 to 30, has been called off by the Milwaukee Automotive Dealers' Association, it has been announced. Refusal of the State Fair management, to accept the usual annual rental of \$4,000 for the Automobile building at the fair grounds, and a demand for rentals amounting to approximately \$40,000, constituted the reasons why the association will not again stage the annual fall show, instituted in 1915.

The disagreement developed out of a suit brought by a taxpayer against the State Fair board, the Commissioner of Agriculture of Wisconsin, and the Milwaukee Automotive Dealers' Association, demanding that space rentals at the State Fair be equalized.

Commissioner of Agriculture John D. Jones, in an official statement said that the automobile show was not dropped by the board. He said the Milwaukee dealers simply did not accept the fair board's proposition.

### Other Exhibitors Objected

"The old arrangement was so unfair and made automobile exhibitors so preferred that it was indefensible," said Mr. Jones. "Other exhibitors objected. When the matter was brought to my attention on July 24, I decided that the situation could not continue, so the plans were changed. We gave the automotive dealers the opportunity to take a solid block of space in the new Manufacturers' building on the same basis as other exhibitors. They have not accepted, but the offer is still open."

The controversy reached its climax when O. E. Remey, manager of the State Fair, declined to accept \$4,000 offered by R. W. Leach, president of the M. A. D. A., Hereford White, chairman of its show committee, and Bart J. Ruddle, executive secretary and manager. Acting on Commissioner Jones' instructions, Mr. Remey refused to turn over the keys to automobile hall.

"The whole thing happened so suddenly and without any cause that we were dumfounded," said President Leach. "The automobile show has been advertised all over Wisconsin by the State Fair board and the advertisements are still running in daily, weekly and other publications."

### MANAGES PACKARD SALES

DES MOINES, Aug. 18.—S. P. Johnson, for many years connected with the Kruidenier Cadillac Co. of Des Moines, has been appointed sales manager of the Packard Iowa Motor Company.

## Free Airplane Rides Sell Used Cars

COLUMBUS, Ohio, Aug. 18.—The Lawwell-McLeish Co., Ford distributor in Columbus, was quite successful in its sale of used cars through advertising an aeroplane ride with each purchase. Early in July this company found a large number of used cars on hand. Arrangements were made with a commercial airplane owner to take care of the people who desired the rides, and business came in well.

As an alternate the company offered 10 gallons of free gas if the purchaser was not inclined to take the airplane ride.—J. W. Lehman.

## Willys-Overland Stocks Now Normal and Orders Increase

TOLEDO, Aug. 18.—John N. Willys, following retail sales of 18,000 cars in July, by the Willys-Overland Co., declares dealer stocks now are down to a normal basis and factory orders again increasing. He says dealer stocks have been reduced more than 30,000 cars in the past 90 days and factory inventory cut \$11,000,000. Factory current liabilities were reduced \$15,000,000 in the second quarter.

Mr. Willys also declares that his company has reduced its funded debt \$1,000,000 and that it has no bank indebtedness. He does not expect his statement for the first half to show so large net earnings as he would like, because of lower prices but he estimates that quick assets probably will show a ratio better than 5 to 1.

### ALFA-ROMEO AGENCIES FOR U. S.

NEW YORK, Aug. 18.—Rinaldo Stroppa-Quaglia has opened headquarters at 383 Madison Avenue, this city, for the Alfa-Romeo car which recently won the European Grand Prix. It is his intention to place agencies throughout the country for this Italian car.

## Hudson-Essex Sales So Far This Year Ahead of All 1923

**Detroit Company Expects to Turn Out the One Hundred Thousandth Unit About Sept. 1**

DETROIT, Aug. 18.—Sales of Hudson-Essex cars so far this year are 94,362 as against 88,188 for all of last year. With production on both models now going at a rapid rate, the 100,000th car of the year will be manufactured about Sept. 1, Hudson Motor Car Co. estimates. The plant is working at capacity with some departments working nights.

Increase over last year's business has been around 30 to 35 per cent on the Hudson models, while the company estimates that twice as many Essex will be built this year as last. A statement on the general business situation by the company says:

"Business conditions are most encouraging. Many large districts in the United States are now in the market actively for cars which have not been purchasers in any volume for several seasons previously. The feeling of an inevitable slowdown, which was so prevalent a few months ago, is disappearing and we are entering into the harvest time of the year.

"An increase in buying will bring in the familiar circle of increased employment, greater business activity. There is a disposition everywhere to do business. We are getting into a period of well balanced values and really normal business, with a good volume of trade for those who have what the public wants. The public does not want novelty or frills, it wants useful service and value."

### DURANT-STAR AGENT STOPS

WATERLOO, Ia., Aug. 18.—The Mutual Motors Company, Waterloo, Ia., handling Durant and Star cars, is going out of business. William Galloway, head of the company, plans to devote his entire time to the farm machinery manufacturing business which bears his name.

## Expect Many Jobbers and Dealers, Carrying Accessories, to Attend Shows

NEW YORK, Aug. 18.—Interest among jobbers and car dealers in the two days for the trade feature of the next national show is being aroused by Neal Adair, manager of the show department of the Motor and Accessory Manufacturers Association. More than 400 of the middlemen have been written by Mr. Adair, who is asking them if they favor the innovation and if they will take advantage of the great opportunity offered to transact business at the shows.

Replies have been almost unanimous in indorsing the action of the show management in setting aside the trade days. Jobbers say they intended sending their prominent executives, while car dealers carrying accessories as a side line state they will attend the shows, prepared to place orders for goods on display that attract their attention.

Drumming up the attendance this far in advance is expected to stimulate interest among those who will take advantage of the trade days to carefully inspect the exhibits of the parts and accessory makers and buy accordingly.



## Dauvergne in Peugeot Wins French Touring Grand Prix

**Victor Averages 56 M.P.H. With  
Full Load at Gas Gallon Rate  
of 10.7 Miles**

PARIS, Aug. 5.—(By mail).—An average of 56 miles an hour was maintained by Christian Dauvergne, driving a sleeve valve Peugeot 5-passenger car with full load aboard and a gasoline allowance at the rate of 10.7 miles to the American gallon, in the French Touring Grand Prix held at Lyons.

In the four passenger class, running 15 miles to the gallon, the winner was Lecharnay, on a Cottin-Desgouttes car, followed by a second and similar car one-fifth of a second later. Three Mathis cars in the two-seater class, required to average 24 miles to the gallon, were the only ones to finish in their division with an average speed of 47¼ miles an hour.

This race called for a preliminary endurance test, starting at midnight, and lasting eight hours, during which an average of 34, 37, and 43½ miles an hour in the respective classes had to be maintained on a limited amount of gasoline. The course was not lit up and failure of the car lighting set was penalized and points were lost for late arrival.

Only five cars went through without the loss of points, but the penalizations for the others were too low to be of any importance, and in most cases the time lost was wiped out in starting up from cold with the electric starter. The seventeen machines having qualified in the preliminary run set out for the final race. Only one man was allowed aboard, and he could receive no outside assistance, but ballast equivalent to one, three, or four other persons had to be carried.

### Carry Spare Wheels

The bodies had to be built to certain minimum dimensions, spare wheels had to be carried on the outside and hood, windscreen, etc., were required. Voisin built a set of cars in which the body formed the frame, the general design being similar to that of an airplane fuselage, and the construction being of wood, aluminum and duraluminum. With this design, which has a certain similarity to that of the Lancia, now on the market, the passenger's feet are below the level of the drive shaft, and the gearbox is partially between the driver and front passenger. Voisin obtained extremely low weight with this construction, but gained no advantage from it, for the rules called for a minimum of 3,086 pounds for the 5-passenger machines. Nine hundred pounds of dead weight had to be carried in order to comply with this rule.

Rival firms claimed that this type of body would give Voisin an advantage of at least six miles an hour over other machines, and they lodged a protest on the ground that the construction was not in accordance with the spirit of the rules. This protest was not admitted by

## FRENCH TOURING GRAND PRIX FUEL CONSUMPTION RACE

Five Passenger Cars, 10.7 Miles to American Gallon

1. Dauvergne, Peugeot	3:17:34 4/5
Average 56 miles an hour.	
2. Gauderman, Voisin	3:26:43 3/5
3. Piccioni, Voisin	3:40:20 3/5

Four Passenger Cars, 15 Miles to the American Gallon

1. Lecharnay, Cottin-Desgouttes	3:21:03
2. Colas, Cottin-Desgouttes	3:21:03 1/5
3. Rost, Georges Irat	3:28:42 4/5
4. Morel, Voisin	3:31:24 3/5
5. Porporato, La Buire	3:31:55 4/5
6. Duray, Aries	3:36:07 1/5
7. Flohot, Aries	3:41:43 4/5
8. Buchetti, Ansaldo	3:48:02 4/5

Two Passenger Cars, 24 Miles to the American Gallon

1. Lams, Mathis	3:57:13 1/5
Average 47.2 miles an hour.	
2. Bocchi, Mathis	4:01:43 1/5
3. De Bremond, Mathis	4:15:42 3/5

the jury and in consequence the other competitors issued a statement through the Press. Various incidents in the race, including an accident to Rougier, who broke his arm when his car overturned, prevented the Voisins winning, but the design nevertheless showed that it gave an advantage in the matter of speed.

### Along Voisin Lines

Senecal adopted the same general lines of construction as Voisin, with a frameless chassis, the rear wheels enclosed, and the running boards inside the body, according to the general ideas of Forostowsky. The driver of one of these cars evidently dozed during the night and ran off the course. On the second car twenty pounds of ballast were lost by reason of a torn sack, and the car, which had proved itself the fastest in the preliminary test, was not allowed to start in the final.

These new body designs were one of the leading features of the race and indicate that manufacturers are seeking to economize power by reducing head resistance. The cars were only partially standard, most of the engines being normal ones prepared for these particular conditions. Peugeot, who used a Knight type, and Cottin Desgouttes, with a valve in the head engine, had dry sump lubrication, the latter having an oil reservoir and radiator on the right hand side of the car, and the Peugeots having the whole of their oil supply in a chassis tank. Immensely high compression ratios were used, and engine speed was fairly low. Every car in the race had mechanical four wheel brakes.

### MAKE BODY FOR FOREIGN TRADE

INDIANAPOLIS, Aug. 18.—The Mills-paugh & Irish Corp. of this city has started production on a limousine type body for foreign trade. It will be used with the Dodge Brothers No. 3 chassis. The local company also is manufacturing taxicab bodies for export and reports active markets in South America, Canada, Hawaii, the Philippines, Japan and Australia.

## Question Box to Be Leading Feature of P. A. A. Convention

WILKES-BARRE, Pa., Aug. 18.—One of the many splendid features of the fourth Annual Business Convention of the Pennsylvania Automotive Assn. to be held in Wilkes-Barre Oct. 17 and 18, will be a large "question box" at the door of the big assembly hall into which individual dealers or associations can put articles for consideration, discussion and action during the open forum meetings.

This gives the opportunity for each delegate to bring up anything about his business for consideration.

The P. A. A. Directors urge that every association in the state present a paper in this manner.

"This will be a dealers' convention, of the dealer, for the dealer, and by the dealers," an announcement says.

A half dozen city associations have already arranged to go in a body by special train and in some cases the association is paying the railroad fare of the members.

It is apparent at this time that close to 1000 dealers will be in attendance. Reservations should be made through George Bray, Chairman of the P. A. A. Convention Committee at Keystone Motor Co., 170 S. Washington street, Wilkes-Barre.

## St. Louis Dealers Gratified Over Improvement in Sales

ST. LOUIS, Mo., Aug. 8.—Automobile dealers here for the past month have been very much gratified over the increase in sales. Carl P. Spiegelberg, manager of the Willys-Overland branch, says July was the best month his company had during the year, while Tate Motor Co., Dodge Brothers distributors, reports July the best month since April. Other companies have all stated that July showed a definite improvement over the previous months of the year.

## Seasonal Slump Has Passed, Capital's Reports Indicate

Think Steady Dwindling of Surplus  
Automotive Workers Now  
Can be Looked For

WASHINGTON, Aug. 18.—The automobile industry is out of the seasonal slump which has gripped it for the past few months and steady dwindling of the army of surplus automobile workers can be looked for, it is gleaned from the dispatches from automotive centers contained in the August number of the Industrial Employment Information Bulletin just made public by the U. S. Employment Service. The point is emphasized, however, that the transition to normalcy cannot be made at once and in some instances only very slight improvements are noted.

Three cities in Michigan reported this month. Two of them, Lansing and Muskegon broadcast encouraging reports while Flint does not. The latter sends word that "automobile plants are operating only part time, affecting 15,000 to 18,000 men, and there is a surplus of automobile workers."

Lansing, however, contributes the good news that "employment in the automobile industry is a little more encouraging" while Muskegon also vouchsafes "some improvement was noted in the employment situation."

### Other Reports

Following are other reports contained in the bulletin:

Wisconsin, Milwaukee industrial district: A slight improvement was noticeable during July in motor accessory plants and they are adding a few men.

Ohio, Cleveland: Considerable unemployment exists in Cleveland at the present time, particularly in the automotive industry.

Ohio, Toledo: A large surplus of labor is reported in the automobile trade.

Ohio General Forecast: Automobile tire production is increasing although considerable unemployment still exists among these workers.

### HANDLE BUICK

CHARLOTTE, N. C., Aug. 18.—C. C. Coddington, Inc., Buick distributors, announce the appointment of G. C. McManus and W. P. Horton as Buick dealers in Albemarle, N. C. This is not a new agency for Buick, but a change in ownership. Mr. McManus is also chief owner of the Motor Service Company, distributor of Auburn and Hupmobile. The present location of the Motor Service Company will be taken over by the new Buick agency, and the Motor Service Company will move to new quarters.

### MEACHEM GEAR MOVES

SYRACUSE, N. Y., Aug. 18.—The Meachem Gear Corp. has moved from 411 Canal Street, Syracuse, to its new plant at 122-142 Dickerson Street.

## Chicago Trade Association Proposes Movement Designed for Improvement of Dealer Conditions

Avoidance of Yearly Models and Check on Output Before Retailer  
Accumulates More Than 45-Day Stock, Among Reforms Urged

NEW YORK, Aug. 18.—Appointment of committees representing the National Automobile Chamber of Commerce and the National Automobile Dealers' Association "to investigate automobile merchandising conditions and make recommendations for such changes as would improve dealer conditions" is asked for by the Chicago Automobile Trade Association.

Accompanying this request is a letter from the Chicago association, outlining its views as to the present situation and making suggestions as to how it believes conditions might be improved.

No formal action on the letter has been taken by either of the bodies appealed to by the Chicagoans. The Chamber has sent copies of the letter to its members for their information, while General Manager C. A. Vane of the N. A. D. A. has circularized his membership, asking each if the Chicago conditions are apparent elsewhere and if any other local dealer association has taken similar action. Also he asks if there is any necessity for such action as proposed by Chicago. When this survey is completed, it is expected Mr. Vane will decide on what the next step will be.

### Meeting Largely Attended

The Chicago letter is signed by Vice-President Dayton Keith and follows a meeting last month which, he says, was

attended by practically all of the distributing organizations in that territory. He declares that it was unanimous that the Chicago viewpoint be presented to the manufacturers.

Citing Chicago's views, Mr. Keith declares his fellow members desire to avoid yearly models. They believe manufacturers should "study the country's power of absorption to the point where production is retarded before a dealer has to accumulate more than 45 days' supply of cars at any one time." They think manufacturers should study the retailers' financial statements and where operating costs demand it, discounts should be raised.

Dealers should be aided in solving the used car problem through the factories studying the retailers' capacity "to make commercially sound exchanges for used cars," Chicago says.

New models should not be advertised until they are ready for dealer distribution or at least not until the dealers' warehouses are cleared of old models, it is held, while there should be a definite time for announcing such new models—preferably around July 1. Avoidance of the term "New 1929 Model Just Out," is suggested.

Dealers, too, would be helped, Chicago thinks, if price changes came at some definite period, rather than being spread out over several months.

### DEALER ASSIGNS

ROCHESTER, N. Y., Aug. 18.—Thomas F. Vogt, Inc., Overland and Willys-Knight dealer here, has made a voluntary assignment for the benefit of creditors to William H. Clemons, a representative of the Willys-Knight Company. Schedule of assets and liabilities were not filed. Mr. Vogt said his financial difficulties were brought about by the depreciation in value of a large number of second hand cars which he had taken in trade on new machines. He intends to go into business again at once and pay every dollar he owes, he announces.

### MORE NEW FIRMS IN DIXIE

ATLANTA, Ga., Aug. 18.—New automotive companies formed recently in the south include the following: Webb-North Motor Co., Forth Worth, Tex., \$75,000 capital; Purcell Motor Co., Madison, N. C., \$50,000 capital; Wake Motor Co., Raleigh, N. C., \$25,000 capital; the Crossman Co., Womack, Tex., \$50,000 capital.

### STAGES GAS MILEAGE TEST

ROCHESTER, N. Y., Aug. 18.—M. B. Leahy, Inc., Durant and Star distributor, has concluded a series of tests to determine the gas mileage of a Star car. He popularized the tests locally by offering \$2,000 in prize coupons good on purchases of Star cars, to those guessing nearest the correct mileage each day during the week of the test.

Each day a special gallon tank was filled and sealed by the city sealer and a newspaper man or other impartial party acted as official observer.

The car in the seven runs covered 236.7 miles on seven gallons of gasoline making an average of 33.8 miles to a gallon for the week. The highest mileage obtained from a gallon during the test was 42.9 miles and the lowest 26.4 miles.

### TAKE GARDNER AGENCY

MINNEAPOLIS, Aug. 18.—The Fawkes Automobile Co., Minneapolis, has taken the state agency for the Gardner car. This company also Reo distributor.



## Federal Aid Present Fiscal Year \$4.70 Per Motor Vehicle

### Nevada Drawing \$947,623 Gets Highest Amount Based on Its Number of Automotive Units

WASHINGTON, Aug. 18.—A total of \$4.70 for each passenger car, truck and motorcycle is to be expended by the federal government on good roads during the fiscal year ending June 30, 1925. This is 15 cents less per automotive unit than the amount spent by the federal government on highways during the fiscal year which just ended on June 30.

Apportionment of the federal aid funds, just announced by the U. S. Bureau of Public Roads, show that exclusive of administrative cost the federal government will spend \$72,759,375 on its highway federal-aid program, or approximately \$10,000,000 more than was spent for the fiscal year ending June 30, 1924, when a total of \$63,375,000 was paid out.

The figure of \$4.70 in expenditure for each automotive unit is arrived at on a basis of Automotive Industries' registration on July 1, 1924, of 15,523,898 cars and trucks and the federal government's federal-aid budget of \$72,759,375 for the fiscal year of 1925.

#### Nevada Gets Most

An analysis of the figures show that Nevada, with a registration on July 1, 1924, of 15,995 cars and trucks, receiving federal aid amounting to \$947,623 for the fiscal year of 1925 will receive the highest amount of public road money based on its automotive units. That state's quota being \$59.10 for each vehicle, New Mexico ranks second, her motorist receiving \$33.90 of funds for each automotive unit from the federal government; Wyoming, third with \$25.20, and Utah fourth with \$12.60.

In the matter of apportionment, Massachusetts, with a registration of 561,836 cars and trucks, will receive only \$1.95 per automotive unit from the federal government, being the smallest in proportion to its registration, and receiving only \$1,089,806 from the United States treasury for good roads.

#### TOLEDO TRADE "SATISFIED"

TOLEDO, Aug. 18.—While sales have not been running as high in the Toledo territory as they did a year ago, stocks of new cars are only moderate on the whole and only a few exceptions among dealers have any number of the 1924 models on hand. It is estimated that the dealer stocks of new cars are about sufficient for 15 days' business.

Sales in June were off about 26 per cent as compared with a year ago and in July down about 24 per cent. Dealers quite generally feel that last year was abnormal and are fairly well satisfied with business this year, taking into consideration the industrial slump of recent weeks.

## Wisconsin Law Forbids Dimming Motor Headlights, and Here Is the Argument

"Would You Drive Your Car 20 to 30 Miles an Hour Blindfolded?" Asks Commission—Which Briefly Explains State Rule

MILWAUKEE, Aug. 18.—The idea that dimming headlights in night driving is the proper method has been given a new jolt by the Wisconsin Industrial Commission's bureau of illumination. A bulletin being given general circulation among motorists through municipal agencies makes these points:

"Would you drive your car 20 to 30 miles an hour blindfolded?"

"Of course you would not, and yet that is what people do in effect when they dim their headlights when passing each other on the highway.

"Everyone knows that bright lights shining in the eye blind a person and cause accidents. Not so many people know that suddenly dimming the headlights on passing another car also blinds the driver and that this procedure caused just as many highway accidents as glaring lights.

"What person has not been partially blinded for a few moments when stepping from a brightly lighted room into a dark cellar stairway? The effect is the same when you suddenly dim your headlights. To be sure, both drivers stop the glare, but they also rob themselves of the light necessary to see. If memory of what he saw just before dimming were

not a helpful factor to the driver, the number of night accidents due to dimming would be appalling.

"For this reason the Wisconsin law forbids dimming your headlights, and the secretary of state so advises every motorist in his bulletin accompanying the license plates.

"But this does not mean that you may cause blinding glare. You are required to have a light on the road which is so good that you can see a dark object 200 feet ahead of your car and at the same time not blind the other driver.

"Such a light, when the lights are not dimmed, will throw a direct beam down the road at least 200 feet, but no part of the beam will rise above the level of the headlights and hence will not glare the other driver.

"A few simple adjustments will give you a light not only legal and safe but actually better. Therefore, for selfish reasons, if for no other, you will benefit from a little attention to your headlights."

The commission has for distribution a booklet explaining in full how to make adjustments to bring headlights within the law.

## Baltimore's Child Accidents Are Traced Mostly to Trucks

BALTIMORE, Md., Aug. 18.—That fatal accidents to Baltimore children are caused largely by trucks is proved by statistics. During a month beginning April 14 and ending in the middle of May, trucks were responsible for eight of nine child deaths on the streets. And trucks comprise only 8 or 10 per cent of the city's motor vehicles.

More stringent requirements for drivers, daily inspection of cars and trucks and enlistment of drivers in the safe drivers' schools are outstanding suggestions made by Paul F. Stricker, director of the Baltimore Safety Council as a remedy for the situation.

#### DISTRIBUTOR DIES

ATLANTA, Ga., Aug. 18.—J. A. Taylor, president and treasurer of the Paige-Jewett Sales Co., operating in Memphis and Atlanta as distributors of the Paige and Jewett line in most of the southern territory, died recently at his home in Memphis at the age of 65 years.

#### LARGE HOUSE FOR DORT

COLUMBUS, Ohio, Aug. 18.—A large new garage and storeroom located at 781-785 E. Main St., will soon become one of the important automobile show rooms and service stations in the city.

E. C. Johnson, who operates Johnson's Court House Garage, has leased the entire building and also the double apartments adjoining; thus providing for one of the largest automobile salesrooms in Columbus. Mr. Johnson will open on September 1, with a line of new 1925 model Dort automobiles, prepared to furnish service and storage, in addition to the selling end. The lease calls for 10 years. New machinery is being installed, in direct co-operation with the Dort factory.

#### GET FORD FRANCHISE

WAUPUN, Wis., Aug. 18.—The S. & N. Motor Sales Co., Waupun, has been organized by Guy F. Stelsel and Don C. Newcomb to take over the Ford franchise, relinquished by J. W. Meiklejohn & Son, pioneer Ford dealers in Central Wisconsin.

## Car Impounding Act Sought in Movement for Indiana

### Indianapolis Mayor Launches Project in Hope of Reducing Hazards of Highway Travel

INDIANAPOLIS, Aug. 18.—A state-wide movement to work for the enactment of a driver license law in the forthcoming session of the legislature has been started by Mayor Lew Shank of this city in an endeavor to cut down the accident and speeder peril.

Mayor Shank sent a letter to mayors of other Indiana cities asking co-operation in the safety plan that will permit the courts to revoke driver licenses and impound their cars when found guilty of reckless driving and other major infractions of traffic and safety regulations. Some of the officials have already assented to the plan. Neither the local motor club nor the automobile trade body have yet announced their stands in the matter.

In the first six months of the year in Indianapolis 999 speeders were convicted in the local courts against but 580 in a similar period last year. The local traffic court has been giving some convicted drivers the right to impound their cars instead of paying large fines in cases where jail would be the other alternative, because of lack of money to pay fines, where no jail sentence was meant. The fatal accident rate curve began to rise alarmingly last month. Drastic steps against unguarded rail crossings in the city have been announced by the city administration.

### MANY AT FORD CLINIC

ST. PAUL, Minn., Aug. 18.—The Motor Power Equipment Co., 2512 University Avenue, established to distribute and sell accessories, Fords and Fordsons, will open its first branch at Fargo, N. D., in charge of Peter Enger, formerly manager there for the Oliver Chilled Steel Plow Company.

More than 1,000 Ford dealers attended the week trade clinic at the St. Paul headquarters. This was conducted by representatives of the Ford Motor Co. from Detroit and local men. A. W. Logan is general manager.

### PAIGE-JEWETT FORCE PICNIC

ROCHESTER, N. Y., Aug. 18.—Employees of the Paige Sales Company, distributors of the Paige and Jewett cars in Rochester territory, held their annual picnic on the farm of Charles F. Paige. An automobile parade with about 50 cars in line, went through the business section of the city and then on to the farm. The feature of the parade was a car disguised to represent the cartooned "Toonerville Trolley." Sports and dancing were enjoyed at the farm.

## Inlaid Road Signs to Mark Trails

MONTREAL, Can., Aug. 18.—The public works department of Montreal will shortly inaugurate a system of traffic guidance intended to facilitate tourists problems.

Up to the present directional signs have been used, the markings being in white paint. These are not durable it has been found. Trial will be made of colored markings, inlaid in the roadbed. According to the plan. Varied colors will be used to denote various routes. Thus one color will be followed for guidance to the center of the city, while another will mark the turns for roads leading to other important centers, such as Toronto, Quebec, etc.

## Georgia's Bus Bill Suffers Third Death in Legislature

ATLANTA, Ga., Aug. 18.—By a vote of 115 to 70, the Georgia House of Representatives defeated the motor bus bill, introduced earlier in the session, and by the terms of which the motor bus industry in the state would have been placed under the jurisdiction of the Georgia Public Service Commission, subject to substantially the same rules and regulations as are the railroads.

This is the third successive year the same bill as been introduced, and the third successive year it has been defeated. While there is a possibility that it may come up again this year it is very unlikely, because strong opposition has been worked up against it by the legislative committee of the Atlanta Automobile Association, with the co-operation of the larger motor bus operators throughout the state.

### BALLOONS HELP WHEEL PLANTS

MOLINE, Ill., Aug. 18.—Balloon tires have been a large help to the wheel industry, according to a statement of Edward A. Evans, general manager of the Mutual Wheel company of this city.

"We are also enjoying good business with jobbers on replacement wheels for ordinary high pressure tires and also on replacement wheels for Ford cars and trucks," said Mr. Evans.

Balloon tire wheels manufactured by the local company are wooden with steel felloes.

### REPRESENTS STUDEBAKER

KALAMAZOO, Mich., Aug. 18.—F. D. Travis, general manager of the Travis Motor Sales Company, Plainwell, Mich., has taken over the Kalamazoo-Studebaker agency, previously conducted by Lurie Brothers.

## Bank Optimistic as Result of Tire Survey Revelations

### Increase in Replacement Business Expected in Next Three Months Reducing Dealer Stocks

CHICAGO, Aug. 18.—Banking interests have been investigating the condition of the tire industry and as a result of a survey recently completed, the Illinois Merchants Trust Co. is inclined to be optimistic as to present situation, predicting larger profits per tire during most of 1924 than in 1923, providing there are no important changes in prices.

This survey was made by Rudolf A. Clemon, who estimates that at the present time about 11,000,000 tires are being carried by dealers and 7,000,000 by manufacturers—a total surplus supply of 18,000,000. This, on a basis of 45,000,000 tires consumed in 1923, represents about a five months' supply, he says.

"It is expected that an increase in the replacement business will take place in the next three months, which will reduce dealers' stocks materially," Mr. Clemon continues. "A further and greater reduction in production at the factories will be necessary if producers' stocks are to be brought down to a normal basis. Yet some factories are continuing at a pace of 25,000 tires a day. On the whole, however, manufacturers want to begin the autumn business with small stocks."

Mr. Clemon then adds:

"The tire industry as a whole is rather well prepared for a period of temporarily declining business. Many are carrying rather light supplies of crude rubber and cotton fabrics. Financially, too, tire companies are in a fairly good position. Bank loans are at a record low, and the larger companies have conserved their resources. As a result their cash position compares favorably with that of 1919. At the end of 1923 five of the leading companies had cash on hand of \$9,000,000 and inventories of \$73,000,000, compared with cash of \$36,000,000 and inventories of \$121,000,000 in 1919. In 1923 cash was 40 per cent of inventory, and in 1919 only 30 per cent.

"Today labor costs are better, wages at the factory are lower, and labor more efficient. Daily production at the present time averages nearly three tires per worker, whereas shortly after the war it was only one tire."

### BUYS CADILLAC AGENCY

DAVENPORT, Ia., Aug. 18.—The Erdice-Cadillac Company of Oskaloosa, Ia., has purchased the Cadillac sales agency of the Cadillac Motor Company in Davenport, Ia., owned by K. J. Zoller. E. S. Erdice will take charge, with A. C. Erdice continuing at the Oskaloosa office. Mr. Erdice has been Cadillac distributor 14 years and now has western Illinois and eastern Iowa Cadillac territorial rights.



## Lexington Price Advances Range From \$30 to \$150

### Two New Models on "Concord" Chassis Have Been Added and One on "Minute Man"

CONNERSVILLE, Ind., Aug. 18.—Complete advance in prices ranging from \$30 to \$70 on the "Concord" model and from \$85 to \$150 on the "Minute Man" models, were announced by the Lexington Motor Company effective Aug. 1.

On the "Concord" chassis, two new models have been added, 5-passenger enclosed touring, and a special sport touring model, listing at \$1595 and \$1695 respectively.

On the "Minute Man" chassis a new 5-passenger sedan with two additional "taxi" seats listing at \$2830, has been added to the line. Balloon tires are now standard equipment on all models on both chassis.

The following table shows the old and new prices:

<b>"CONCORD"</b>			
	Old Price	New Price	
5-pass. Touring.....	\$1465	\$1495	
5-pass. Touring (Encl.).....	New	1595	
5-pass. Special Touring.....	New	1695	
5-pass. Sedan.....	1915	2085	
<b>"MINUTE MAN"</b>			
2-pass Roadster.....	1895	2045	
5-pass. Touring.....	1895	1995	
5-pass. Lark Touring.....	2145	2230	
5-pass. Cal. Touring.....	2195	2295	
7-pass. Touring.....	1995	2095	
7-pass. Cal. Touring.....	2295	2395	
5-pass. Royal Coach.....	2295	2430	
5-pass. Brougham.....	2395	2530	
5-pass. Sedan.....	New	2830	

### MORE ROOM FOR STUTZ

INDIANAPOLIS, Aug. 18.—The Stutz Motor Car Company of America bought additional property at Eleventh Street and Capitol Avenue which will give it control of the entire block of land upon which the major part of the plant has stood. The church which has occupied this site will be razed and additional plant buildings will be erected.

### TAKE ON PAIGE-JEWETT

SPRINGFIELD, Ill., Aug. 18.—Elliott Van Brunt, Inc., Springfield, Ill., has acquired both the Paige and Jewett agencies in this territory from Charles H. Edmonds, who is retiring from the field. The Elliott-Van Brunt Company now holds five agencies, the Packard, Willys-Knight and Overland.

### AUBURN HEAD TO EUROPE

AUBURN, Ind., Aug. 18.—J. I. Farley, president of the Auburn Automobile Company, has sailed for Europe to visit Auburn distributors there and to investigate business conditions on the Continent and in England. He expects to be gone a month.

## Makes Employees Gift of His Business

CHICAGO, Aug. 18.—John Emery, owner of the Livery Auto company of Chicago, has presented his business to the six oldest employees of his service and has retired from business.

He called the men into his office and surprised them with the announcement of his plans to compensate them in this manner for faithful service.

## Contract Signed for Building Motor Speedway at Charlotte

CHARLOTTE, N. C., Aug. 18.—Contract has been signed by Fred Johnson, representing the Prince Speedway Construction Co., with Charlotte Speedway, Inc., to build an automobile speedway near this city. The contract stipulates that the track must be finished at least two weeks prior to date of races some time that month.

The track will be one and a quarter miles long. The project is being financed by Charlotte men and will cost approximately \$300,000. Fifteen drivers already have agreed to participate in the races. Jack Prince, who will build the track, says he is going to build a track that will make possible a speed of 120 to 125 miles an hour.

### FLINT ADDS DEALERS

FLINT, Mich., Aug. 18.—T. S. Johnston, general sales manager of the Flint Motor Co., announces the following dealer appointments:

Weippert's Battery Shop, Scottville, Mich.; R. F. Dutwell, Manistee, Mich.; W. R. Robertson, Martinville, Va.; Clarence P. Rea, Covington, Va.; Motor Sales & Truck Co., Leeksville, N. C.; O. O. Davis, Shenandoah, Va.; Annapolis Flint Co., Annapolis, Md.; George N. Allen, Portageville, Mo.; Dorchester Auto Sales Co., Mass. Ave., Dorchester, Mass.; Mansfield Flint Co., Mansfield, O.; White Star Garage, Ashland, Ky.; Rite & Cook, Mattoon, Ill.; Central Auto Sales & Service, 3453 S. Morgan, Chicago, Ill.; Ogg Motor Car Co., Pontiac, Ill.; Center Line Garage, Center Line, Mich.; L. D. Ulrey, 216 N. El Dorado St., Stockton, Cal.; Rutherford Flint Co., Rutherford, N. J.; Nathan Haddad, Clothier, W. Va.; Chas. Page Hamrick, Case, W. Va.

### REO BRANCH DISCONTINUED

DANVILLE, Ill., Aug. 18.—The Reo Motor Car Company has discontinued its factory branch in this city and Sol E. Brandles, in charge for several years, has been transferred to the bus department. He will remain in this city. The Reo agency here has been sold to I. N. Davis, former salesman for the company, who formed a partnership with John Giovanini, to take over the business.

## Cleveland Sales Are Running About Even With Last Year

### Stocks in Hands of Dealers Have Been Reduced to About a Thirty- Day Supply

CLEVELAND, Aug. 18.—Sales of automobiles in Cleveland during the present year are about even with this time last year. Warner M. Bateman, Reo distributor, and one of the best known dealers in the city, says when an average is struck among all the Cleveland dealers it will be found that sales this year are 100 per cent of what they were last year. He looks for better business in the fall.

Mr. Bateman cited registrations to show that dealers in Cleveland on the average have not fallen very far, if any, below their 1923 record.

Bearing out this assertion is the statement of Herbert Buckman, of the Cleveland Automobile Manufacturers and Dealers Association, that stocks of automobiles in Cleveland dealers' hands have been so materially reduced there is only about a 30-day supply on hand. This statement is backed by a survey, which has been made by the Cleveland association.

The stock reported is less than 4,000 cars, and during the month of June there were 3,500 sales of new cars recorded.

"The late spring affected the automobile business as it did all other lines of commerce," said Mr. Buckman. "This caused a retardation of buying."

J. R. Laughlin, manager of the used car bureau of the Cleveland Automobile Club, says license transfers this year are 20 per cent greater than they were last year and that at least 90 per cent of these transfers have been made on new cars.

Last year at this time the license transfers numbered 10,000. This year the number is 12,000.

### 400 ATTEND CLAMBAKE

SPRINGFIELD, Mass., Aug. 18.—More than 400 men and women, including officers and employees of J. S. Harrington, Inc., of this city and the Harrington-Hudson Company of Hartford, and other Hudson and Essex dealers in this vicinity, took part in the annual outing and clambake of these organizations, at Riverside Park, Agawam, August 6. A program of field sports was put on. The tug of war was won by Hartford and the baseball game went to Springfield by a score of 8 to 6. M. B. Godman had charge of the athletics for Springfield and William Smith for Hartford.

### ACQUIRE SERVICE QUARTERS

HARTFORD, Conn., Aug. 18.—The Capitol Buick Co., Hartford, Conn., which recently took over the Buick in this territory has secured commodious service quarters in the Ashwell Building, 320 Ann Street.

## WITH THE ASSOCIATIONS

### To Resist Bills

DALLAS, Tex., Aug. 18.—The Texas Automobile Dealers' Association is lining up to fight proposed legislation which would increase license fees or other taxes on automobiles. They claim such taxes, whether in the shape of licenses, tax on dealers or salesmen, or tax on owners, reduce sales and hurt the business. At a meeting of the officials and some members of the association at Waco plans for combating tax boosts on the part of the legislature which convenes in January, were discussed. At that meeting it was announced the association was instrumental in having the present license fee reduced 50 per cent of the original proposal and aided in bringing about the defeat of a bill which would put an extra tax on the dealers and salesmen, by showing this tax would eventually be passed to the owner.

Just what tax measures affecting automobile owners and dealers are contemplated by the legislature the association did not say. It is certain a flock of bills will be introduced under the guise of raising money for this and that, the officers of the association say, and the organization just wants to be ready to fight such proposals.

### Resignation Causes Shifts

ROCHESTER, N. Y., Aug. 18.—The personnel of the board of directors of the Rochester Automobile Dealers' Association has been changed due to the resignation of John L. Hicks as president of the association. G. Norton Mortimer of the Mortimer-Manley Motor Car Company, Nash and Pierce-Arrow distributors, was elected director in place of Mr. Hicks. J. E. Hansen's place as vice-president has been filled by R. D. Burch of the Burch-Buell Chevrolet Corporation and his duties as secretary will be performed by Roy C. Miller of Miller-Lee Motors, Overland and Willys-Knight dealers.

The officers and board of directors for the balance of the year are: J. E. Hansen, president; R. D. Burch, vice-president; Roy C. Miller, secretary; J. J. Williams, treasurer. Other members of the board are: Charles P. Gallagher, George W. Henner and G. Norton Mortimer.

Activities of the association will be carried on as usual and the fall program is being worked into shape.

### TAKE BIG FAIR SPACE

PEORIA, Ill., Aug. 18.—The Peoria Automobile Dealers and Accessory Association will fill to overflowing the 25,000 square feet of floor space in Machinery hall allotted to them at the Implement Fair here Sept. 26-Oct. 4. Accessory men will have booths from 200 to

400 square feet and the automobile dealers from 600 to 1,800 feet. A. G. Thede, chairman, F. D. Smith and W. E. Johnston are handling the association's interests in arranging this display of the latest cars and equipment.

### Nearly All In On Show

INDIANAPOLIS, Aug. 18.—The annual State Fair Auto Show to be held here in connection with the Indiana State Fair, Sept. 1 to 5, will include the exhibit of every important distributor here, although a few of the dealers who have no state territory outside the city will not show. The exhibit will be conducted by the State Fair authorities, as the Indianapolis Auto Trade Association for whom the exhibit building was erected by the fair authorities gave up its lease for the fair week last year. Officially the trade association is not giving the exhibit although John B. Orman, manager of the association, will manage the exhibit for the Fair Board.

### Barbecue Is Feature

CHARLOTTE, N. C., Aug. 18.—The Charlotte Automotive Trades Association turned one of its weekly luncheon meetings into a barbecue which was greatly enjoyed by the membership. Speeches were taboo, eating and good fellowship being the principal business of the gathering.

Charlotte accessory men attending the recent Automotive Equipment Association meeting in Tennessee were: T. M. Glasgow, president of the association; T. R. Stewart, chairman of the credit men's division of the association, J. G. Fitzsimons and Wade Montgomery.

### Join Radio Association

MILWAUKEE, Aug. 18.—Most of the principal dealers in the automotive electrical field are members of the newly organized Wisconsin Radio Trade Association, for manufacturers, jobbers and dealers. Michael Ert, distributor of the Willard battery, is president; George Andrae, Julius Andare & Son Co., is vice-president; J. D. Harvey, Badger Radio Co., secretary-treasurer. A big radio exposition is planned.

### Tent Exhibit Planned

QUINCY, Ill., Aug. 18.—Members of the Quincy Auto Trades Association have rented a tent 80-280 feet with space for 108 cars for their Adams County Fair exhibit, Sept. 1-5. It promises to be one of the largest shows the association has ever attempted and the big top will be handsomely decorated for the event.

## Maxwell-Chrysler Taken On by Wright Co. of Cleveland

### Popular Distributors Quit Willys-Overland Which Extends Its Direct Factory Plan

CLEVELAND, Aug. 18.—The Walter F. Wright Co., has relinquished distribution of the Willys-Overland line in this city, and has taken over the Maxwell, Chrysler cars. The Euclid Avenue Motor Co., former distributor of the Maxwell-Chrysler cars, has not announced its plans, while direct factory contracts with city and suburban dealers have been made for the handling of Willys-Overland cars. George Bollinger is the city sales representative of Willys-Overland with headquarters at 5005 Euclid avenue.

This policy is in direct line with the Willys-Overland policy in recent years to establish a direct contract with its dealer organization. Mr. Bollinger has been with the company for five years, and he comes here from Philadelphia where he occupied a similar position.

Mr. Wright is known as one of the most aggressive dealers in the city. With his service department he established contact with owners which lifted that department from the loss columns, and produced a handsome profit.

The following dealers will act as factory distributors for Willys-Overland: Brookside Garage, 3755 W. 25th street; Buckeye Motor Sales Co., 1022 Superior avenue, N. E.; Reitz-Kirkwood, 18517 Detroit avenue, Lakewood; Ted Suckrow, Motor Sales Co., 11913 Detroit avenue, Lakewood; Lake City Sales Co., 7022 Euclid avenue; Henry Canning, Euclid; Middleton & White, Chagrin Falls; Frank Sauer, Dover Center; James Burns, Olmsted Falls; Wallace Court, Painesville; Service Garage, Willoughby.

### FAKERS WORK AMONG OWNERS

MOLINE, Ill., Aug. 18.—Warning has been issued by Mississippi Motor club officials to tri-city motorists to look out for the agents of fake automobile clubs which are now active.

Manager R. E. Rhoades, of the local motor club stated that "Agents of a number of unauthorized motor clubs have been working here for membership fees, promising in return a detective service, free towing, and a 20 to 25 per cent reduction on the purchase of all automobile accessories. In a large majority of cases, the dupe gets only promises and high pressure sales talk for his money.

### OFFER HIGHWAY COURSE

ANN ARBOR, Mich., Aug. 18.—The University of Michigan announces that between December, 1924, and March, 1925, inclusive, it will offer to professional short period courses in highway engineering and highway transport. Each course will consist of 30 lectures.



# SQUEEKS & RATTLES

UP around Ottawa it is going to be like this: When a motorist extends his hand outward and upward it signals "left turn"; when he extends it outward and downward it means "right turn"; when he extends it straight out horizontally it means "stop."

Glad to see our Canadian friends take so much interest in traffic regulation. We hope, however, they will take no offense if we say that the good old American system is much more simple.

In this land of the brave and home of the free any single signal with the arm covers every possible action from starting, stopping and turning—to backing up.

But when the driver in front of you persistently refuses to signal with the outstretched arm you can bet the wooden collar button that the laundry returns with your new powder blue shirt that he has his best girl with him.

Complaints are made that there is entirely too much petting nowadays on the highways but very likely the kicks are not intended to include most of the present crop of country constables and traffic officers. We submit they are innocent and immune. At the same time, the

popular pastime is considerably different in modus operandi than it was back in the days of our grandparents. That was when preliminaries consisted of wrapping the lines around the whip stock and then murmuring an occasional "Giddap, Dobbin."

## Thanks to the Contributor

Say, they hug upon the buses,  
And they spoon where'er they please,  
Oh, these brazen modern cusses,  
Oh, this Freedom of the Squeeze.

Mr. Davis has been duly informed as to what took place at the memorable New York convention. Now we presume the committee will notify McAdoo and Smith.

## Heck of a Plant

Engine concern carries warning at bottom of its letter-head which conveys this idea: "All Orders Accepted By Us Are Subject To Delays From Strikes, Lockouts, Accidents, Government Action, etc."

Must of been the concern that we used to try to get parts from.

## Coming Motor Events

### Automobile Shows

Chicago	Jan. 24-31, 1925
National Automobile Chamber of Commerce.	
Chicago	Oct. 11-18
Second Annual Closed Car Show, Coliseum, under the auspices of the Chicago Automobile Trade Association. L. L. Fest in charge.	
Chicago	Oct. 21-27
First National Transportation Show in American Exposition Building, promoted by Motor Truck Industries, Inc. William Hallanger, Manager.	
Chicago	Jan. 26-31
Twentieth Annual Automobile Salon.	
Dallas, Texas	Oct. 11-26
Annual Automobile Show, Fair Grounds, under the auspices of the Dallas Automotive Trades Association.	
Detroit	Jan. 17-24, 1925
Detroit Automobile Show, Detroit Dealers' Association.	
El Paso, Texas	Sept. 20-27
Automobile Show, Exposition Grounds, under the auspices of the Automobile Department of the International Fair Association. W. J. Wile and E. C. Heid, General Chairmen.	
Green Bay, Wis.	Aug. 25-30
Automotive Division, Association of Commerce. W. F. Kerwin, Manager.	
Indianapolis	Sept. 1-6
Annual Fall Automobile and Accessory Show, in conjunction with Indiana State Fair, Automobile Building, Fair Grounds. William Jones, Manager.	

Kansas City, Mo.	Feb. 7-14, 1925
Kansas City Motor Car Dealers' Association Show.	
New York	Nov. 9-15
Twentieth Annual Automobile Salon, Hotel Commodore.	
New York	Jan. 3-10, 1925
National Automobile Chamber of Commerce.	
Sacramento, Cal.	Sept. 1-10
State Agricultural Society. C. E. Paine, Manager.	
Toronto, Ont.	Aug. 23-Sept. 6
Canadian Automotive Equipment Association and the Automotive Industries of Canada. Gib Robertson, Secretary.	

### Foreign Shows

Berlin	Sept. 26-Oct. 5
Paris, France	Oct. 2-12
Passenger Car and Accessory Show.	
London, England	Oct. 16-25

### Conventions

Akron, Ohio	Nov. 18-20
Annual Convention of the National Tire Dealers Association.	
Atlantic City	Oct. 14-17
Thirteenth Annual Convention National Hardware Association of the United States, Marlborough-Blenheim Hotel.	
Chicago	Jan. 26-29, 1925
Eighth Annual Convention, N. A. D. A., Hotel LaSalle.	
Cleveland	Nov. 18-19
Joint Service Meeting of the Society of Automotive Engineers and the National Automobile Chamber of Commerce.	

Detroit	Oct. 22-24
S. A. E. Production Meeting and Exhibition.	
Detroit	January
Annual Meeting of the Society of Automotive Engineers.	
New York City	Jan. 7, 1925
New York Show, Convention N. A. D. A., Hotel Commodore.	
White Sulphur Springs, W. Va.	Sept. 17-20
Annual Meeting of the Automotive Electric Association, Greenbrier Hotel.	
Wilkes-Barre, Pa.	Oct. 17-18
Fourth Annual Convention of the Pennsylvania Automotive Association, Hotel Stirling.	

### Races

Altoona, Pa.	Sept. 1
Altoona Speedway Association—250 miles.	
Colorado Springs, Colo.	Sept. 1
Pike's Peak Highway—12½ miles.	
Fresno, Cal.	Oct. 4
Fresno Speedway Association—150 miles.	
Kansas City, Mo.	Oct. 19
Kansas City Speedway Association—250 miles.	
Los Angeles, Cal.	Nov. 29
Los Angeles Speedway Association—250 miles.	
Milan, Italy	Sept. 7
Monza Track—Italian Grand Prix.	
Readville, Mass.	Sept. 6
Short races—Jack Le Cain, Promoter.	
Syracuse, N. Y.	Sept. 13
Horace P. Murphy—100 miles.	

# Prices and Weights of Current Passenger Car Models

Ship.	Wt.	Pass.	Body Style	Price	Ship.	Wt.	Pass.	Body Style	Price	Ship.	Wt.	Pass.	Body Style	Price	Ship.	Wt.	Pass.	Body Style	Price	
AMERICAN "D-66"					CHEVROLET					DUESENBERG					HAYNES					
2985	2-p		Roadster	\$1,950	"Superior"					3200	2-p		Roadster	\$6,500	3295	5-p		Touring	\$1,600	
3175	4-p		Sp. Roadster	2,050	1690	2-p		Sup. Roadster	\$495	3550	5-p		Phaeton	6,250	3590	5-p		Sedan	2,300	
3260	5-p		Touring	1,695	1790	5-p		Sup. Touring	510	3750	7-p		Phaeton	6,750	3560	5-p		Brougham 4 d.	2,200	
3300	5-p		Sport	1,850	1955	5-p		Phaeton DeLuxe	640	3750	4-p		Sp. Phaeton	6,500	HUDSON					
3310	7-p		Touring	1,760	2005	4-p		Sup. Coupe	725	4000	4-p		Coupe	7,500	"Super Six"					
3190	4-p		Sp. Touring	1,885	1880	2-p		Sup. Utility Coupe	640	4350	7-p		Sedan	7,800	3300	4-p		Speedster	\$1,400	
3470	7-p		Sedan	2,550	2070	5-p		Sup. Sedan	795	DU PONT					3425	7-p		Phaeton	1,500	
3310	5-p		Brougham	2,195	CHANDLER SS					"C"					3450	5-p		Coach	1,500	
ANDERSON "41"					2945	2-p		Roadster	\$1,795	3300	2-p		Roadster	\$2,090	3675	7-p		Sedan	2,250	
2650	5-p		Touring	\$1,195	3130	4-p		Roadster	1,785	3400	5-p		Touring	2,090	HUPMOBILE					
2675	4-p		Sp. Touring	1,445	3160	5-p		Touring	1,585	3600	5-p		Touring Sedan	3,050	"R"					
2925	2-p		Coupe	1,425	3218	7-p		Touring	1,735	3600	5-p		Suburban Sedan	3,050	2595	2-p		Roadster	\$1,200	
2725	4-p		Coach	1,495	3250	4-p		Royal Dispatch	1,885	DURANT					2705	5-p		Touring	1,200	
2875	5-p		Sedan	1,695	3380	5-p		Chummy Sedan	1,845	2235	2-p		Roadster	\$1,040	2760	2-p		Coupe	1,440	
2925	5-p		Sp. Sedan	1,895	3600	5-p		Sedan	1,995	2325	5-p		Touring	890	2860	4-p		Coupe	1,595	
			Brougham 3 d.	1,595	3480	7-p		Limousine	3,095	2345	5-p		Touring F.W.B.	940	2975	5-p		Sedan	1,775	
"50"					CHRYSLER					2395	5-p		Sp. Touring	1,090	2875	5-p		Club Sedan	1,450	
2975	7-p		Touring	1,595	2600	4-p		Roadster	1,625	2495	5-p		Coupe	1,340	JEWETT					
3200	7-p		Sedan	1,945	2650	5-p		Touring	1,395	2605	5-p		Sedan	1,365	2690	5-p		Touring	\$1,135	
APPERSON "6"					2650	5-p		Phaeton	1,495	2770	5-p		Touring Sedan	1,465	2810	5-p		DeLuxe Touring	1,290	
2915	5-p		Phaeton	\$1,395	2650	5-p		Sedan	1,725	2550	5-p		Coach	1,185		3-p		Bus. Coupe	1,310	
2965	5-p		Sp. Phaeton	1,600	2915	5-p		Imperial Sedan	1,995	ELCAR					2880	5-p		Sedan	1,545	
3400	5-p		Sedan	1,995	2855	5-p		Brougham	1,895	2560	5-p		Touring	\$995	3095	5-p		DeLuxe Sedan	1,745	
3450	5-p		Sp. Sedan	2,195	CLEVELAND "43"					2585	5-p		Demi Sp. Touring	1,095	2775	5-p		Brougham	1,385	
			"g"		2750	5-p		Touring	1,095	2641	5-p		Sportster	1,195		5-p		Broug. DeLuxe	1,695	
4100	5-p		Phaeton	\$2,485	2810	5-p		Touring De Luxe	1,195	2900	5-p		Sedan	1,495	JORDAN					
4315	7-p		Phaeton	2,535	2830	3-p		Coupe	1,295	2981	5-p		Sp. Sedan	1,695	3000	2-p		Playboy Road.	\$1,850	
4250	5-p		Sport Phaeton	2,900	2840	3-p		Spec. Coupe	1,395	2779	5-p		Brougham 3 d.	1,265	3100	5-p		Touring	1,775	
4440	5-p		Sedan	3,485	2930	5-p		Sedan 2-door	1,395	2829	5-p		"Sp. Brough. 3 d.	1,395	3420	5-p		Brougham 4 d.	2,385	
4570	5-p		Sport Sedan	3,750	3040	5-p		Spec. Sedan 4 d.	1,495	"6-50-51"					3375	4-p		Victoria	2,385	
4555	7-p		Sedan	3,585	COLE MASTER					2600	5-p		Demi Sp. Tour.	\$1,220	(124 1/2 in. W. B.)					
AUBURN "6-43"					3695	4-p		Volante Touring	\$2,325	2690	5-p		Sp. Touring	1,420	3260	4-p		Blueboy Touring	2,095	
2550	5-p		Touring	\$1,095	3765	7-p		West. Tour	2,325	2900	5-p		Sedan	1,720	3585	5-p		Sedan	2,585	
2672	5-p		Special Touring	1,295	3695	4-p		Aero-Vol-Tour.	2,475	2981	5-p		Sp. Sedan	1,920	Series "A"					
2772	5-p		Sp. Touring	1,365	3950	5-p		Bourette Sedan	3,225	2779	5-p		Brougham	1,490	6000	2-p		Playboy Road.	2,575	
2850	5-p		Coupe Touring	1,595	4090	7-p		Royal Sedan	3,225	2829	5-p		Sp. Brougham	1,620	3100	5-p		Touring	2,575	
2852	5-p		English Coach	1,845	4150	7-p		Royal Limousine	3,325	"6-61"					3420	5-p		Brougham	2,875	
2932	5-p		Sedan	1,695	COLUMBIA					2007	5-p		Touring	\$1,585	3375	4-p		Victoria	2,775	
			"6-63"		2480	2-p		Roadster	1,775	3380	5-p		Sedan	2,245	3585	5-p		Sedan	2,975	
3262	5-p		Touring	\$1,695	2485	5-p		Spec. Touring	1,275	3675	5-p		Sp. Sedan	2,395	KING					
3332	5-p		Sp. Touring	1,935	2510	2-p		Coupe	1,375	3380	4-p		Brougham	1,995	(120 in. W. B.)					
3562	5-p		Sedan	2,445	2725	5-p		Coach	1,575	"8-80"					3428	2-p		Sportster	\$1,895	
3572	5-p		Brougham	2,245	2810	5-p		Sedan	1,775	3-p					3428	4-p		Foursome	1,595	
BARLEY "6" 6-50					CUNNINGHAM					5-p					3528	5-p		Touring	1,595	
2750	5-p		Touring	\$1,395	"V-4"					7-p					3645	3-p		Coupe	2,200	
2800	5-p		Sp. Touring	1,495	4600	7-p		Touring	\$6,300	ESSEX	2130	5-p		Touring	\$900	3875	5-p		Sedan	2,400
3100	5-p		Sedan	1,850	4500	4-p		Sp. Touring	5,800	2305	5-p		Coach	1,000	3400	5-p		Road King Sedan	1,495	
3150	5-p		Sp. Sedan	2,250	4700	4-p		Coupe	7,150	FLINT					4-p		Sedanette	1,995		
BUICK "Standard"					5000	6-p		Sedan	7,650	3-p					(124 in. W. B.)					
2750	2-p		Roadster	\$1,150	DAGMAR "6-70"					3000	5-p		Sp. Roadster	\$1,630	3428	2-p		Sportster	\$1,995	
2800	2-p		Roadster Encl.	1,190	3800	4-p		Sp. Touring	\$3,500	3200	4-p		Touring	1,495	3428	4-p		Foursome	1,795	
2920	5-p		Phaeton	1,175	4200	4-p		Sedan	4,500	3575	4-p		Sport Touring	2,050	3528	7-p		Touring	1,795	
2970	5-p		Phaeton Encl.	1,250	DANIELS					3000	5-p		Touring	1,495	3645	4-p		Coupe	2,400	
3075	4-p		Coupe	1,565	4150	4-p		Touring	\$6,800	"55"					3875	7-p		Sedan	2,625	
3185	5-p		Dbl. Service Sedan	1,475	4765	7-p		Touring	6,900	5-p					3400	7-p		Road King Sedan	1,795	
3245	5-p		Regular Sedan	1,665	4600	4-p		Sedan	7,600	5-p					5-p			Sedanette	2,295	
			"Master		5200	7-p		Sedan	7,800	"40"					(124 in. W. B.)					
(120 in. W. B.)					DAVIS "90"					FORD					3428	2-p		Sportster	\$1,995	
3300	2-p		Roadster	\$1,365	2650	3-p		M. O'War Road.	\$1,495	1395	2-p		Runabout	\$265	3428	4-p		Foursome	1,795	
3455	5-p		Phaeton	1,395	2915	4-p		Legionaire Tour.	1,495	1517	5-p		Touring	295	3528	7-p		Touring	1,795	
3675	4-p		Coupe	2,125	2750	5-p		Phaeton	1,395	With Starter and Dem. Rims					3645	4-p		Coupe	2,400	
3845	5-p		Sedan	2,225	3070	5-p		Sedan	1,895	1540	2-p		Runabout	\$350	3875	7-p		Sedan	2,625	
(128 in. W. B.)					3065	5-p		Berline Sedan	1,995	1662	5-p		Touring	380	3400	5-p		Road King Sedan	1,495	
3470	3-p		Sp. Roadster	\$1,750	2700	5-p		Brougham	1,595	1772	2-p		Coupe	525	3400	5-p		Sedan	2,400	
3605	5-p		Sp. Phaeton	1,800	DODGE BROTHERS					1950	5-p		Sedan, Fordor	685	3400	5-p		Road King Sedan	1,495	
3645	7-p		Phaeton	1,625	2835	3-p		Roadster	1,795	1898	5-p		Sedan, Tudor	590	4-p		Sedanette	1,995		
3940	5-p		Brougham Sedan	2,350	3020	5-p		Phaeton	1,695	FRANKLIN "10 C"					3428	2-p		Sportster	\$1,995	
4020	7-p		Sedan	2,425	3245	5-p		Sedan	2,195	2580	5-p		Touring	\$1,950	3428	4-p		Foursome	1,795	
4475	5-p		Sedan Limousine	2,525	3050	5-p		Brougham	1,895	2710	4-p		Coupe	2,750	3528	7-p		Touring	1,795	
			Town Car	2,925	3215	5-p		Berline Sedan	2,295	2730	5-p		Sedan	2,850	3645	4-p		Coupe	2,400	
CADILLAC "V-63"					DODGE BROTHERS					GARDNER					3875	7-p		Sedan	2,625	
4190	4-p		Roadster	\$3,085	2494	2-p		Roadster	\$865	2520	2-p		Roadster	\$945	3400	5-p		Road King Sedan	1,495	
4280	7-p		Touring	3,085	2653	2-p		Spec. Roadster	1,025	2550	2-p		Radio Roadster	1,135	4-p		Sedanette	1,995		
4200	4-p		Phaeton	3,085	2591	5-p		Touring	895	2555	5-p		Touring	995	LEXINGTON					
4270	2-p		Coupe	3,875	2755	5-p		Spec. Touring	1,055	2650	5-p		Tour. DeLuxe	1,165	"Concord"					
4370	5-p		Sp. Coupe	3,950	2793	4-p		Coupe	1,375	2750	5-p		Rad. Spec. Tour.	1,145	5-p		Touring	\$1,495		
4600	5-p		Sedan	4,400	2755	2-p		Coupe B	1,035	2895	5-p		Sedan	1,475	5-p		Touring (Enc.)	1,595		
4610	7-p		Sedan	3,585	2929	4-p		Spec. Coupe	1,535	3070	5-p		Sp. Sedan	1,575	5-p		Spec. Touring	1,695		
4480	5-p		DeLuxe Sedan	4,150	3050	5-p		Sedan B	1,250	2680	5-p		Coupe	1,275	5-p		Sedan	2,085		
4530	5-p		Town Brougham	4,600	3098	5-p		Sedan A	1,385	"Series 5"					2-p		Roadster	2,045		
4640	7-p		Limousine	4,600	3190	5-p		Spec. Sedan	1,545	2520	2-p		Roadster	\$945	5-p		Touring	1,995		
4640	7-p		Suburban	4,500	DORRIS					2550	2-p		Radio Roadster	1,135	5-p		Lark Touring	2,250		
4560	7-p		DeLuxe Suburban	4,250	4120	4-p		Pasadena Tour.	\$4,150	2555	5-p		Touring	995	5-p		Cal. Touring	2,295		
4380	4-p		Victoria	3,275	4115	7-p		Touring	3,950	2650	5-p		Demi-Sedan	2,250	7-p		Cal. Touring	2,395		
4475	5-p		Landau	3,650	4193	4-p		Coupe	4,985	2765	5-p		Brougham	2,850	5-p		Royal Coach	2,450		
CASE					4200	5-p		Sedan	5,550											



# Prices and Weights of Current Passenger Car Models

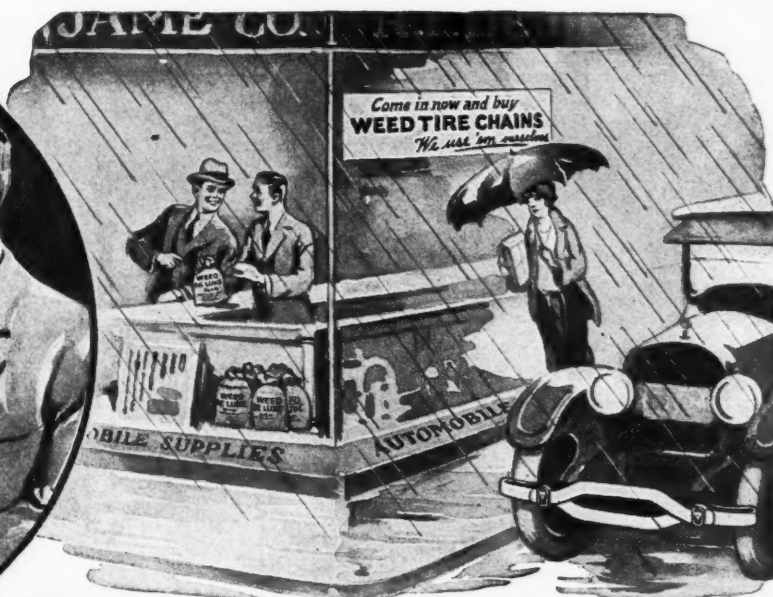
Ship.	Wt.	Pass.	Body Style	Price
LOCOMOBILE				
5030	4-p	"48"	Sportif Tour.	\$7,400
5330	5-p	"48"	Touring	7,400
5600	7-p	"48"	Victoria Sedan	9,990
5464	7-p	"48"	Brougham	9,990
5640	7-p	"48"	Tour. Limousine	9,000
5868	7-p	"48"	Encl. Drive Lim.	9,990
5624	7-p	"48"	Cabriolet	10,250
McFARLAN				
4600	2-p	"6" TV	Roadster	\$5,400
4600	4-p	"6" TV	Sport Touring	5,600
4700	7-p	"6" TV	Touring	5,700
4900	4-p	"6" TV	Coupe	6,720
5200	4-p	"6" TV	Tour. Sedan	6,720
5200	7-p	"6" TV	Tour. Sedan	6,810
5200	7-p	"6" TV	Sp. Sedan	6,600
5200	7-p	"6" TV	Sub. Sedan	7,000
5100	7-p	"6" TV	Limousine	6,900
5200	7-p	"6" TV	Town Car	9,000
3700	3-p	"Light 6" SV	Roadster	\$2,600
3700	5-p	"Light 6" SV	Touring	2,600
3700	7-p	"Light 6" SV	Touring	2,700
3850	4-p	"Light 6" SV	Coupe	3,100
4850	5-p	"Light 6" SV	Sedan	3,100
4850	7-p	"Light 6" SV	Sedan	3,200
MARMON				
3470	2-p	"34"	Speedster	\$3,295
3650	4-p	"34"	Speedster	3,295
3575	4-p	"34"	Phaeton	3,095
3690	7-p	"34"	Phaeton	3,095
3770	4-p	"34"	Coupe	3,585
3970	4-p	"34"	Sedan	3,985
4155	7-p	"34"	Sedan	3,985
4220	7-p	"34"	Suburban	4,285
4100	7-p	"34"	Limousine	4,285
4000	7-p	"34"	Town Car	4,285
MAXWELL				
2225	2-p	"25"	Roadster	\$885
2250	5-p	"25"	Touring	895
2470	5-p	"25"	Sp. Touring	1,055
2325	2-p	"25"	Club Coupe	1,025
2450	5-p	"25"	Club Sedan	1,095
2650	5-p	"25"	Sedan	1,325
MOON				
2400	4-p	Series "A"	Roadster	\$1,350
2400	4-p	Series "A"	Road. Spec.	1,150
2410	5-p	Series "A"	Sp. Touring	1,295
2410	5-p	Series "A"	Tour. Spec.	1,095
2625	5-p	Series "A"	Sedan 2 d.	1,595
2625	5-p	Series "A"	Sedan, 2 d Spec.	1,495
2750	5-p	Series "A"	Sedan 4 d.	1,695
2750	5-p	Series "A"	Sedan 4 d Spec.	1,595
"6-40"				
2860	5-p	"6-40"	Touring	\$1,395
2870	5-p	"6-40"	Sp. Touring	1,595
2920	4-p	"6-40"	Coupe	1,785
2920	5-p	"6-40"	Sedan	1,795
3090	5-p	"6-40"	Petite Sedan	1,995
"6-50"				
2850	5-p	"6-50"	Touring	\$1,595
2970	5-p	"6-50"	Sp. Touring	1,695
3120	5-p	"6-50"	Sedan	1,985
3190	5-p	"6-50"	Sp. Sedan	2,195
"6-58"				
3270	5-p	"6-58"	Touring, Spec.	2,150
3510	7-p	"6-58"	Sp. Touring	\$2,150
3510	7-p	"6-58"	Sedan	2,585
3590	5-p	"6-58"	Sedan, Spec.	2,585
3590	5-p	"6-58"	Petite Sedan	2,685
3590	7-p	"6-58"	Petite Sedan	2,785
NASH				
2960	5-p	"Special"	Touring	\$1,095
3120	5-p	"Special"	Sedan	1,295
"Advanced"				
3250	3-p	"Advanced"	Roadster	\$1,375
3250	5-p	"Advanced"	Touring	1,375
3540	5-p	"Advanced"	Sedan	1,695
"Advanced"				
3370	7-p	"Advanced"	Touring	\$1,525
3670	7-p	"Advanced"	Sedan	2,290
3620	4-p	"Advanced"	Coupe	2,190
OAKLAND				
2510	3-p	"6-54"	Sp. Roadster	1,195
2485	5-p	"6-54"	Touring	1,095
2550	5-p	"6-54"	Sp. Touring	1,195
2620	3-p	"6-54"	Business Coupe	1,295
2720	4-p	"6-54"	Coupe	1,495
2860	5-p	"6-54"	Sedan	1,545
2860	5-p	"6-54"	Landau Sedan	1,645
OLDSMOBILE				
2145	2-p	"30"	Roadster	\$875
2270	2-p	"30"	Sp. Roadster	985
2170	5-p	"30"	Touring	875
2320	5-p	"30"	Sp. Touring	1,015
2295	2-p	"30"	Bus. Coupe	1,045
2410	4-p	"30"	Coupe	1,175
2570	5-p	"30"	Sedan	1,250
2700	5-p	"30"	DeLuxe Sedan	1,350
OVERLAND				
1769	2-p	"91" (100 in. wheelbase)	Roadster	\$495
1863	5-p	"91" (100 in. wheelbase)	Touring	495
1918	5-p	"91" (100 in. wheelbase)	Touring DeLuxe	560
2177	2-p	"91" (100 in. wheelbase)	Coupe	650
2130	5-p	"91" (100 in. wheelbase)	Sedan	795
2004	5-p	"91" (100 in. wheelbase)	Coupe Sedan	655
2047	5-p	"92" (106 in. wheelbase)	Red Bird	\$695
2044	5-p	"92" (106 in. wheelbase)	Red Bird Spec.	735
2090	5-p	"92" (106 in. wheelbase)	Blue Bird	725
2004	5-p	"92" (106 in. wheelbase)	Black Bird	695
2090	5-p	"92" (106 in. wheelbase)	Black Bird Spec.	735
PACKARD				
3165	4-p	"6" (126 in. W. B.)	Roadster	\$2,785
3320	5-p	"6" (126 in. W. B.)	Touring	2,585
3255	4-p	"6" (126 in. W. B.)	Sp. Touring	2,750
3400	4-p	"6" (126 in. W. B.)	Coupe	3,275
3515	5-p	"6" (126 in. W. B.)	Coupe	3,450
3565	5-p	"6" (126 in. W. B.)	Sedan	3,375
3610	5-p	"6" (126 in. W. B.)	Sedan Limousine	3,425
3430	7-p	"6" (126 in. W. B.)	Touring	\$2,785
3690	7-p	"6" (126 in. W. B.)	Sedan	3,625
3765	7-p	"6" (126 in. W. B.)	Sedan Limousine	3,675
3880	4-p	"8" (136 in. W. B.)	Runabout	3,850
3990	5-p	"8" (136 in. W. B.)	Touring	3,650
3930	4-p	"8" (136 in. W. B.)	Sp. Touring	3,800
4125	4-p	"8" (136 in. W. B.)	Coupe	4,550
4200	5-p	"8" (136 in. W. B.)	Coupe	4,725
4270	5-p	"8" (136 in. W. B.)	Sedan	4,650
4275	5-p	"8" (136 in. W. B.)	Sedan Limousine	4,700
4020	7-p	"8" (136 in. W. B.)	Touring	\$3,850
4275	7-p	"8" (136 in. W. B.)	Sedan	4,900
4850	7-p	"8" (136 in. W. B.)	Sedan Limousine	4,950
PAIGE				
3677	4-p	"8"	Phaeton	\$1,895
3742	7-p	"8"	Phaeton	1,895
3880	4-p	"8"	Phaeton DeLuxe	2,095
4040	5-p	"8"	Sedan	2,595
4128	7-p	"8"	Sedan	2,595
4300	7-p	"8"	Sub. Limousine	2,895
4100	5-p	"8"	Sedan DeLuxe	2,770
3900	5-p	"8"	Brougham 4 d.	2,175
4285	7-p	"8"	Sedan DeLuxe	2,770
PEERLESS				
3050	2-p	"6-70"	Roadster	\$2,350
3175	5-p	"6-70"	Touring	2,285
3550	7-p	"6-70"	Touring	2,485
3550	5-p	"6-70"	Sedan	2,995
3550	5-p	"6-70"	Coupe	2,950
3550	7-p	"6-70"	Sedan	3,295
3980	4-p	"8"-66	Tour. Phaeton	\$2,690
4300	5-p	"8"-66	Touring	2,750
4355	7-p	"8"-66	Sedan	3,690
4430	7-p	"8"-66	Sedan	3,840
4130	4-p	"8"-66	Berline	4,090
4130	4-p	"8"-66	Victoria Coupe	3,390
PIERCE-ARROW				
4350	2-p	"33"	Runabout	\$5,250
4590	5-p	"33"	Touring	5,250
4780	3-p	"33"	Coupe	6,800
4830	4-p	"33"	Sedan	6,900
4960	7-p	"33"	Sedan	7,000
4750	4-p	"33"	Coupe Sedan	6,900
4730	6-p	"33"	Brougham	6,800
4850	7-p	"33"	Limousine	7,000
4600	7-p	"33"	Enclosed Lim.	7,000
4780	7-p	"33"	French Lim.	7,000
4732	6-p	"33"	Landaulet	7,000
3640	3-p	"60"	Phaeton	2,895
3720	5-p	"60"	Roadster	3,895
3720	5-p	"60"	Sedan	3,995
3720	5-p	"60"	Enc. Drive Sedan	4,045
3720	4-p	"60"	Coupe	4,045
PREMIER				
3710	2-p	"6-D"	Roadster	\$2,885
3870	5-p	"6-D"	Open-Touring	2,885
3920	7-p	"6-D"	Touring	2,935
3910	5-p	"6-D"	Sp. Touring	2,985
4320	7-p	"6-D"	Sedan	4,175
4185	5-p	"6-D"	Brougham	4,175
REO				
3172	5-p	"T-5"	Sta. Touring	\$1,395
3182	5-p	"T-5"	Sport Touring	1,595
3325	4-p	"T-5"	Coupe	1,875
3515	5-p	"T-5"	Sedan	1,985
3695	5-p	"T-5"	Brougham 4 d.	2,235
REVERE				
3700	2-p	"M"	Roadster	\$3,200
3500	4-p	"M"	Speedster	3,200
3800	5-p	"M"	Touring	3,200
4300	5-p	"M"	Sedan	4,000
RICKENBACKER				
2815	3-p	"C"	Sp. Roadster	\$1,645
2880	5-p	"C"	Sp. Touring	1,595
3050	4-p	"C"	Coupe	2,095
3160	5-p	"C"	Sedan	2,195
4-p	"A"	Sport phaeton	\$2,195	
4-p	"A"	Coupe	2,695	
5-p	"A"	Sedan	2,795	
ROAMER				
3100	2-p	"6-54-E" (118 in. W. B.)	Roadster	\$2,685
3100	4-p	"6-54-E" (118 in. W. B.)	Tourer	2,485
3300	4-p	"6-54-E" (118 in. W. B.)	Sp. Touring	2,750
3300	7-p	"6-54-E" (118 in. W. B.)	Touring	2,685
3300	3-p	"6-54-E" (118 in. W. B.)	Cabriolet	3,285
4100	5-p	"6-54-E" (118 in. W. B.)	Spec. Sedan	\$4,250
4200	7-p	"6-54-E" (118 in. W. B.)	Suburban-Sedan	3,950
3650	4-p	"4-75-E"	Sport	3,650
3200	2-p	"4-85-E"	Spec. Speedster	3,785
ROLLIN				
2300	5-p	"4-75-E"	Touring	\$995
2315	3-p	"4-75-E"	Coupe Roadster	1,195
2485	5-p	"4-75-E"	Sedan	1,295
R & V KNIGHT				
3840	4-p	"H"	Sp. Roadster	\$2,400
3800	5-p	"H"	Touring	2,300
3850	7-p	"H"	Touring	2,375
4050	5-p	"H"	Coupe	3,000
4160	5-p	"H"	Club Sedan	3,050
4165	7-p	"H"	Club	3,250
ROLLS ROYCE				
Chassis—\$10,895. Prices of complete cars to be obtained from factory, Springfield, Mass.				
STANLEY				
3770	5-p	"740"	Phaeton	\$2,750
3910	7-p	"740"	Phaeton	2,750
4075	5-p	"740"	Sedan	3,585
4170	7-p	"740"	Sedan	3,985
STAR				
1700	2-p	"Star"	Roadster	\$540
1790	5-p	"Star"	Touring	540
1880	5-p	"Star"	Spec. Touring	640
1930	2-p	"Star"	Coupe	695
2115	5-p	"Star"	Sedan	785
2150	5-p	"Star"	Spec. Sedan	935
STEARNS-KNIGHT				
3775	4-p	"4"	Coupe Roadster	\$1,795
4250	5-p	"4"	Touring	1,595
3750	4-p	"4"	Sedan	2,095
3750	4-p	"4"	Coupe Brougham	1,895
3750	5-p	"4"	Brougham	2,095
3775	5-p	"4"	Touring	\$2,395
3850	7-p	"4"	Touring	2,495
4025	2-p	"4"	Coupe	3,395
4275	4-p	"4"	Sp. Coupe	3,150
4275	7-p	"4"	Sp. Sedan	3,395
3950	5-p	"4"	Brougham	3,200
STERLING-KNIGHT				
3200	4-p	"4"	Sp. Touring	\$2,250
3235	5-p	"4"	Phaeton	2,150
3450	5-p	"4"	Sedan	2,800
3450	4-p	"4"	Sp. Brougham	2,750
STEVENS-DURYEA				
4200	2-p	"4"	Roadster	\$8,150
4400	7-p	"4"	Touring	7,500
4250	4-p			

# Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

MAKE AND MODEL		Wheelbase (Ins.)	TIRES		Make	Model	ENGINE				Electrical System		Clutch	Gear-set	Universal Joints	REAR AXLE		BRAKES				Steering Gear	Rear Springs		
			Standard Size (Ins.)	Ballon Equipment			Number of Cylinders, Bore and Stroke (Ins.)	Rated Horsepower, N.A.C.C.	Valve Arrangement	Piston Material	Number of Main Crankshaft Bearings	Oiling System				Carburetor Make	Ignition System Make	Generator and Starter Make	Type and Make	Make	Type and Make			Type and Make	Gear Ratio
American D-66	127	33x4 1/2	No	H-Sp	91	6-3 1/2 x 5	29.40	L	C	3	PS	Str	A-K	G-D	P-B&B	War	M-Har	F-Sal	5.10	E-R	I-R	None	Lav	S-57 1/2	
Anderson 41	115	32x4	Yes*	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Zen	Wes	Rem	P-B&B	Dur	F-Thi	1/2 Sal	4.75	E-R	E-T	Mec*	Gem	S-58	
Anderson 50	122	32x4	Yes*	Cont	8R	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Zen	Wes	Rem	P-B&B	Dur	F-Thi	1/2 Sal	4.62	E-R	E-T	Mec*	Gem	S-58	
Apperson 6	120	32x4	Yes*	Fall	T8000	6-3 1/2 x 4 1/2	23.44	L	C	3	PS	Str	Rem	Rem	P-Roc	Mec	M-Thi	1/2 Col	5.10	E-R	I-R	Mec*	Lav	J-48	
Apperson 8	130	33x5	No	Own	8	8-3 1/2 x 5	33.80	L	C	3	PS	Str	Joh	Rem	Bij	D-Own	Own	M-Thi	1/2 Own	4.25	E-R	I-R	Mer*	Own	J-48
Auburn 6-43	114	31x4	Yes*	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Str	Rem	Rem	P-B&B	War	M-Uni	1/2 Col	4.63	E-R	E-T	Mec*	Jac	S-57	
Auburn 6-63	122	32x4 1/2	Yes*	Weid	Spec	6-3 1/2 x 5	25.35	L	C	3	PC	Str	Rem	Rem	P-B&B	War	M-Thi	1/2 Col	4.63	E-R	E-T	Mec*	Jac	S-57	
Barley 6-50	118	32x4	No	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Str	Del	De	P-B&B	Ful	R-M&E	1/2 Col	5.11	E-R	I-R	None	Jac	S-56	
Buick "Standard"	114 1/2	31x4.7	Yes	Own	Sta	6-3 x 4 1/2	21.60	L	C	4	PS	Mar	Del	Del	D-Own	Own	M-Own	1/2 Own	4.66	E-F	I-R	Mec	Jac	S-55 1/2	
Buick "Master"	120	32x5.7	No	Own	6	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Mar	Del	Del	D-Own	Own	M-Own	1/2 Own	4.10	B-F	I-R	Mec	Jac	V-40 1/2	
Cadillac V-63	132	33x5	Yes*	Own	63	8-3 1/2 x 5 1/2	31.25	L	C	3	PC	Own	Dei	Dei	D-Own	Own	M-Spi	F-Own	4.50	E-F	I-R	Mec	Own	N-54	
Case JIC	122	32x4 1/2	Yes	Cont	8R	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Sch	Del	Del	D-Own	Own	R-Sne	1/2 Col	4.90	E-R	I-R	Hyd*	Jac	S-53	
Case Y	132	33x5	No	Cont	6T	6-3 1/2 x 5	33.75	L	C	4	PC	Ray	Del	Del	D-Own	Own	R-Sne	1/2 Col	4.40	E-R	I-R	None	Jac	S-57	
Chalmers Y	117	32x4	No	Own	6	6-3 1/2 x 4 1/2	25.35	L	A	3	PS	Str	A-L	A-L	P-Mec	War	M-Mec	1/2 Tim	5.13	E-R	I-R	Hyd*	Gem	S-56	
Chalmers Y	122	33x4 1/2	No	Own	6	6-3 1/2 x 4 1/2	25.35	L	A	3	PS	Str	A-L	A-L	P-Mec	War	M-Mec	1/2 Tim	5.13	E-R	I-R	Hyd*	Gem	S-56	
Chandler SS	123	31x6.2	Yes	Own	6	6-3 1/2 x 5	29.40	L	C	4	PC	Sch	Bos	Bos	P-B&B	Own	M-The	F-Own	4.45	E-R	E-T	Mec*	Own	S-58 1/2	
Chevrolet Superior	103	30x3 1/2	No	Own	6	4-3 1/2 x 4	21.76	L	C	3	PS	Zen	Rem	Rem	K-Own	Own	M-Own	1/2 Own	3.77	E-R	I-R	None	Own	Q-28	
Chrysler Sir	112 3/4	29x4 1/2	Yes	Own	43	6-3 x 4 3/4	21.60	L	A	7	FP	Str	Rem	Rem	D-Own	Own	M-Own	1/2 Own	4.60	E-F	E-T	Hyd	Jax	S-51 1/2	
Cleveland 43	115	31x5.2	Yes	Own	43	6-3 1/2 x 4 3/4	23.44	L	C	3	PC	Sch	Bos	Bos	P-B&B	Own	R-Sne	1/2 Own	4.90	E-R	E-T	Hyd*	CAS	S-53	
Cole Master	127 1/4	20x7.3	Yes*	Nort	311	8-3 1/2 x 4 1/2	39.20	L	A	3	PC	She	Del	Del	D-Nor	Nor	M-Spi	F-Col	4.70	E-R	I-R	None	Gem	S-57	
Columbia 115	115	31x4	Yes*	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Str	A-L	A-L	P-B&B	Dur	M-Spi	1/2 Tim	4.80	E-R	E-T	Hyd*	Gem	S-58	
Crawford 6-73	138	33x4 1/2	No	Cont	6T	6-3 1/2 x 4 1/2	31.54	L	C	4	PC	Zen	Wes	Bos	D-B-L	B-L	M-Spi	1/2 Tim	5.00	E-R	I-R	None	Gem	S-58	
Cunningham V4	142	33x5	No	Own	V4	8-3 1/2 x 5	45.00	L	C	3	FP	Str	Del	Del	D-Own	Own	R-Sne	F-Tim	4.23	E-R	I-R	None	Own	J-62	
Dagmar 6-73	138	33x5	No	Cont	6T	6-3 1/2 x 5 1/2	31.54	L	C	4	PC	Zen	Wes	Bos	D-B-L	B-L	M-Spi	1/2 Tim	5.00	E-R	I-R	None	Lav	S-58	
Daniels 24-38	138	33x5	Yes*	Own	24-38	8-3 1/2 x 5 1/2	39.20	L	C	3	PC	Zen	Del	Del	P-Own	Own	M-Spi	F-Tim	4.23	E-R	I-R	None	Gem	S-58	
Davis 90	115	31x4	Yes*	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Str	A-L	A-L	P-B&B	W-G	M-Pet	1/2 Tim	5.10	E-R	I-R	Hyd*	Ros	S-52	
Davis 91	118	32x4 1/2	Yes*	Cont	8R	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Str	A-L	A-L	P-B&B	W-G	M-Pet	1/2 Tim	5.10	E-R	I-R	Hyd*	Ros	S-52	
Dodge Brothers 116	116	32x4	Yes*	Own	116	4-3 1/2 x 4 1/2	24.03	L	A	3	PS	Ste	N-E	N-E	D-Own	Own	M-Own	1/2 Own	4.54	E-R	I-R	None	Gem	S-55	
Dort 27	115	31x4	Yes*	Fall	T8000	6-3 1/2 x 4 1/2	23.41	L	C	3	PC	Car	Bos	Bos	D-Dtl	Own	M-The	1/2 Fl	4.66	E-R	I-R	None	Gem	V-50	
Duesenberg Straight 8	134	33x5	No	Own	8	8-2 1/2 x 5	26.45	L	A	3	PC	Str	Del	Del	P-Own	Own	R-Cl	1/2 Own	4.90	I-F	E-T	Hyd	Lav	S-59	
Dupont C	124	32x4 1/2	No	H-Sp	90	6-3 1/2 x 5	29.40	L	C	3	PS	Str	Wes	Wes	D-B-L	B-L	M-Spi	F-Col	4.45	E-R	E-T	None	Jac	S-58	
Durant A-22	109	31x4	Yes*	Cont	Spec	4-3 1/2 x 4 1/2	24.03	L	A	3	PC	Til	A-L	A-L	P-Own	War	M-Spi	1/2 Ad	4.33	E-R	I-R	Mec*	War	S-50 1/2	
Elcar 6-41	112	31x4	No	Lyc	CF	4-3 1/2 x 5	21.03	L	A	5	PC	Zen	Del	A-L	P-B&B	W-G	M-Mec	1/2 Sal	4.70	E-R	I-R	Mec*	Ros	S-51	
Elcar 6-51	113	31x4	No	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Str	A-L	A-L	P-B&B	W-G	M-Mec	1/2 Sal	4.70	E-R	E-T	Mec*	Ros	S-51	
Elcar 6-61	118	32x4	Yes*	Cont	8R	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Str	Del	Del	P-B&B	W-G	M-Har	1/2 Sal	4.70	E-R	I-R	Mec*	Ros	S-52	
Elcar 8-80	127	32x6.2	Yes	Lyc	8	8-3 1/2 x 4 1/2	31.25	L	C	5	PS	Ste	Bos	Bos	D-Own	Own	M-Spi	1/2 Own	5.60	E-F	I-R	Hyd	Own	S-58	
Essex 6	110 1/2	31x5.2	Yes	Own	6	6-2 1/2 x 4 1/2	17.32	L	A	3	Sp	Ste	Bos	Bos	D-Own	Own	M-Spi	1/2 Own	5.60	E-R	I-R	None	Own	S-54 1/2	
Flint 41	115	30x5.2	Yes	Own	40	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Til	A-L	A-L	P	War	M-Spi	1/2 Ad	4.77	E-F	E-F	Mec*	War	S-50	
Flint 55	120	32x4 1/2	Yes*	Cont	Spec	6-3 1/2 x 5	27.34	L	C	7	PC	Str	Del	Dej	P-Own	War	M-Spi	1/2 Ad	4.77	E-F	E-F	Mec*	War	S-54	
Ford T	100	30x3 1/2	No	Own	T	4-3 1/2 x 4	22.50	L	C	3	Sp	Str	Wes	Wes	D-Own	Own	M-Own	1/2 Own	3.63	E-T	I-R	None	Own	O-43 1/2	
Franklin 10 C	115	32x4.9	Yes*	Own	10-C	6-3 1/2 x 4	25.35	L	A	7	PC	Str	A-K	A-K	P-M&E	Own	M-Spi	1/2 Own	4.73	E-T	E-R	None	Own	E-38	
Gardner Series 5	112	32x4	Yes*	Lyc	CE	4-3 1/2 x 5	21.76	L	A	5	PC	Zen	Wes	Wes	P-B&B	Mec	M-Pet	1/2 Fl	4.80	I-R	I-R	None	Ros	S-51	
Gray O	104	30x3 1/2	Yes*	Own	R	4-3 1/2 x 4	21.03	L	C	3	Sp	Sec	Wes	Wes	P-Own	Det	R-Sne	1/2 Tim	3.90	I-R	I-R	None	Own	Q-30	
H.C.S. Series 4	120	32x4 1/2	No	Weid	Spec	4-3 1/2 x 5 1/2	22.50	L	C	3	PS	Str	Del	Del	D-B-L	B-L	M-Spi	1/2 Own	4.63	I-R	I-R	None	Gem	S-56	
H.C.S. Series 6	126	32x5	Yes*	Own	6	6-3 1/2 x 5	29.40	L	C	3	FP	Str	Del	Del	D-B-L	B-L	M-Spi	1/2 Own	4.63	I-R	I-R	None	Gem	S-56	
Hatfield 6-5	121	32x4	No	H-Sp	40	6-3 1/2 x 5	25.35	L	C	3	PS	Str	Bos	Bos	P-B&B	Dur	M-Spi	1/2 Col	4.63	E-R	I-R	None	Gem	S-58	
Haynes 60	121	33x5.7	Yes	Own	60	6-3 1/2 x 4 3/4	29.40	L	C	3	PS	Ray	Kin	L-N	D-Own	Mec	M-Thi	1/2 Own	4.41	E-R	E-T	None	Jac	S-54 1/2	
Hudson Super 6	127	33x6.2	Yes	Own	6	6-3 1/2 x 5	29.40	L	A	4	Sp	Ste	Bos	Bos	D-Own	Own	M-Spi	F-Tim	4.45	E-R	I-R	None	Gem	S-58	
Hupmobile Series R	115	32x4	Yes*	Own	R	4-3 1/2 x 5 1/2	16.90	L	A	3	PC	Str	Wes	Wes	D-Lon	Own	R-Uni	1/2 Own	4.87	E-R	I-R	None	Ros	S-56 1/2	
Jewett S	112	31x4	Yes*	Own	6	6-3 1/2 x 5	25.36	L	C	3	PC	Ray	A-K	Rem	D-Lon	War	M-Mec	1/2 Tim							





# The Rainy Day Salesman sells **WEED CHAINS**

For Cord, Fabric  
or Balloon Tires



THE robin gets his best picking in rainy weather. The successful dealer is the same kind of bird—he is wise enough to know that overcast skies forecast WEED CHAIN WEATHER.

Follow the example of the shoe dealer who sticks out a sign that yells "Rubbers"; the haberdasher's sign cries "Umbrellas"—on rainy days be sure to proclaim "WEED CHAINS" with one of the window stickers which we provide for the purpose. Send for a supply today—ask for "Number 9" sales help.



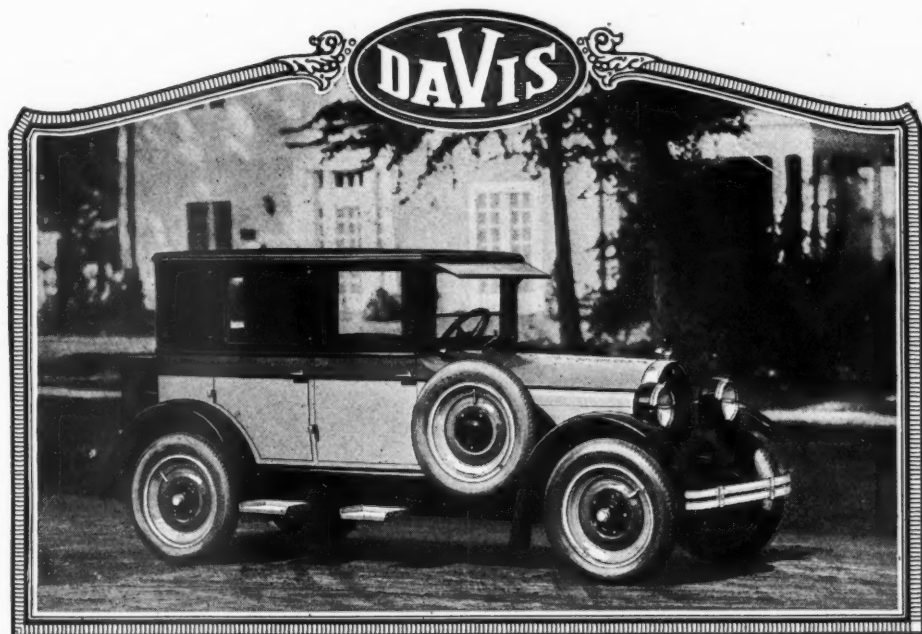
**AMERICAN CHAIN COMPANY, INCORPORATED**  
BRIDGEPORT, CONNECTICUT

In Canada: DOMINION CHAIN COMPANY, LIMITED, Niagara Falls, Ontario

District Sales Offices: Boston Chicago New York Philadelphia Pittsburgh San Francisco  
WORLD'S LARGEST MANUFACTURERS OF WELDED AND WELDLESS CHAINS FOR ALL PURPOSES







DAVIS Series 90 UTILITY BROUGHAM, \$1595—at the factory, plus tax. Trunk and Bumper extra.

## New 1925 Models

For 1925 Davis offers two Series—the Series 90 "light six", in six body styles—and the Mountaineer Series 91, a larger car, in five body styles.

### Dual-Tone Finish

A distinct innovation in the moderate priced field, adding to Davis individuality of appearance. Finish optional in Dual-Tones of either green or gray.

### Four-Wheel Brakes

Lockheed Hydraulic Four-Wheel Brakes are standard equipment on all Davis models for 1925, at no increase in price. Simple, easily adjusted.

### Balloon Tires, Optional

Balloon Tires on all models, if buyer desires, at moderate additional cost.

### Cam and Lever Steering

The Ross Cam and Lever Steering Gear is used on all 1925 Davis models. Road shock is eliminated by this steering gear, and its unique and powerful action overcomes the increased resistance to steering heretofore caused by Four-Wheel Brakes and Balloon Tires.

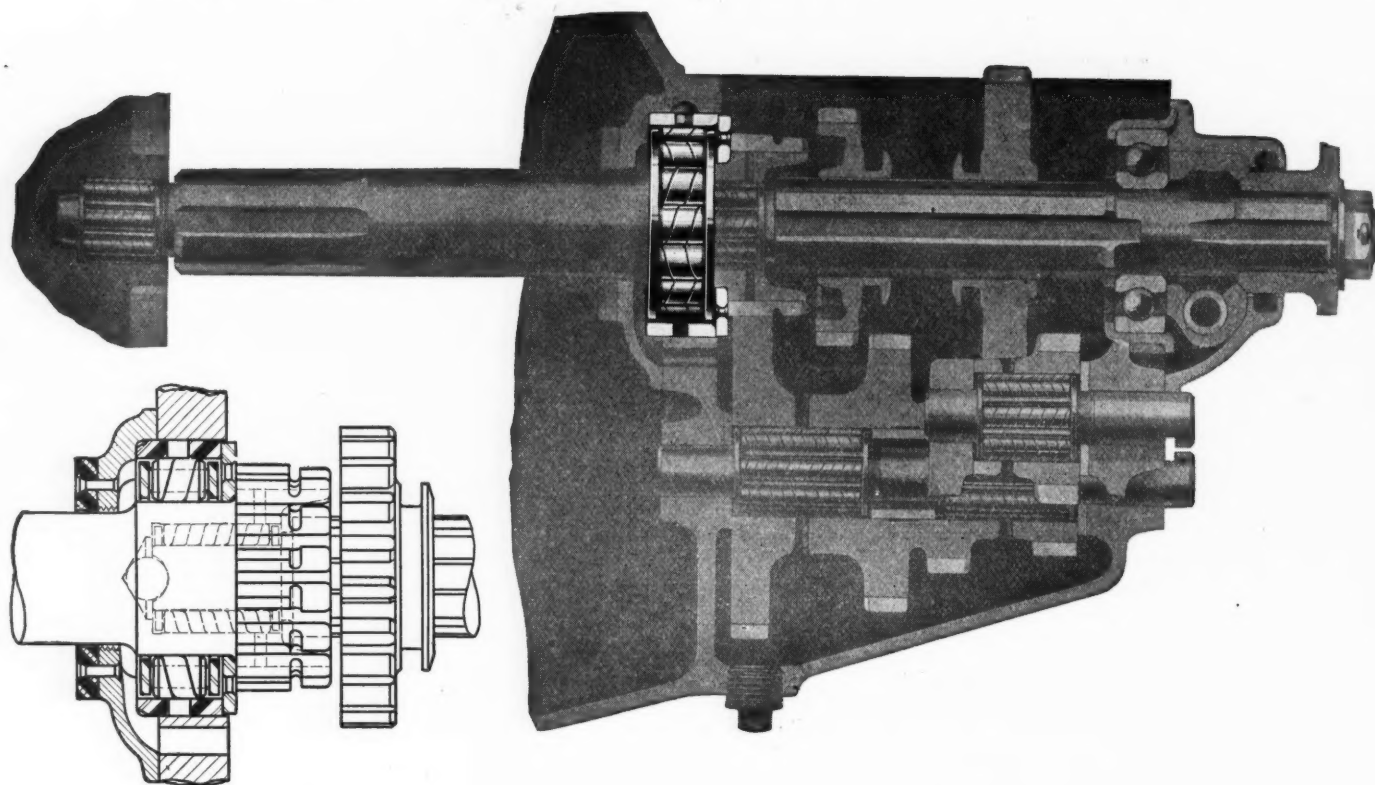
Davis dealers will prosper from the new distinction—the high standard of performance—the noteworthy value—established in these new 1925 Davis models.

GEORGE W. DAVIS MOTOR CAR COMPANY - - RICHMOND, IND.

# DAVIS

"BUILT OF THE BEST"

## Building Higher Quality Transmissions at Low Cost



### No. 1 *On the Mainshaft*

Not only can the quality of a transmission be improved by the use of new series, narrow width Hyatt bearings—but production costs can be decreased as well.

The insistent demand for better transmissions at low cost is well met through the use of these bearings. They will prove a major factor in enabling you to produce that quiet, smooth-running transmission you have been endeavoring to secure as an added selling point.

Hyatt narrow width, new series bearings operate directly on the clutch shaft in front of the main drive gear without an inner race—as illustrated. This, in itself, reduces bearing cost—while the simplified bearing assembly, elimination of

extra parts involved in locking and adjusting arrangements, and the omission of any threading of shafts assure an additional saving of major importance.

Adjustments are neither necessary nor possible with Hyatt bearings. This feature simplifies their installation, makes service operations not only easy but fool proof, and eliminates all worry as to when adjustments should be made.

Install Hyatt narrow width, new series bearings for the main-drive gear position in your transmission and let them prove to your owners and dealers alike that the quality of this unit has been vastly improved.

**HYATT ROLLER BEARING COMPANY**

NEWARK DETROIT CHICAGO SAN FRANCISCO

MILWAUKEE

WORCESTER

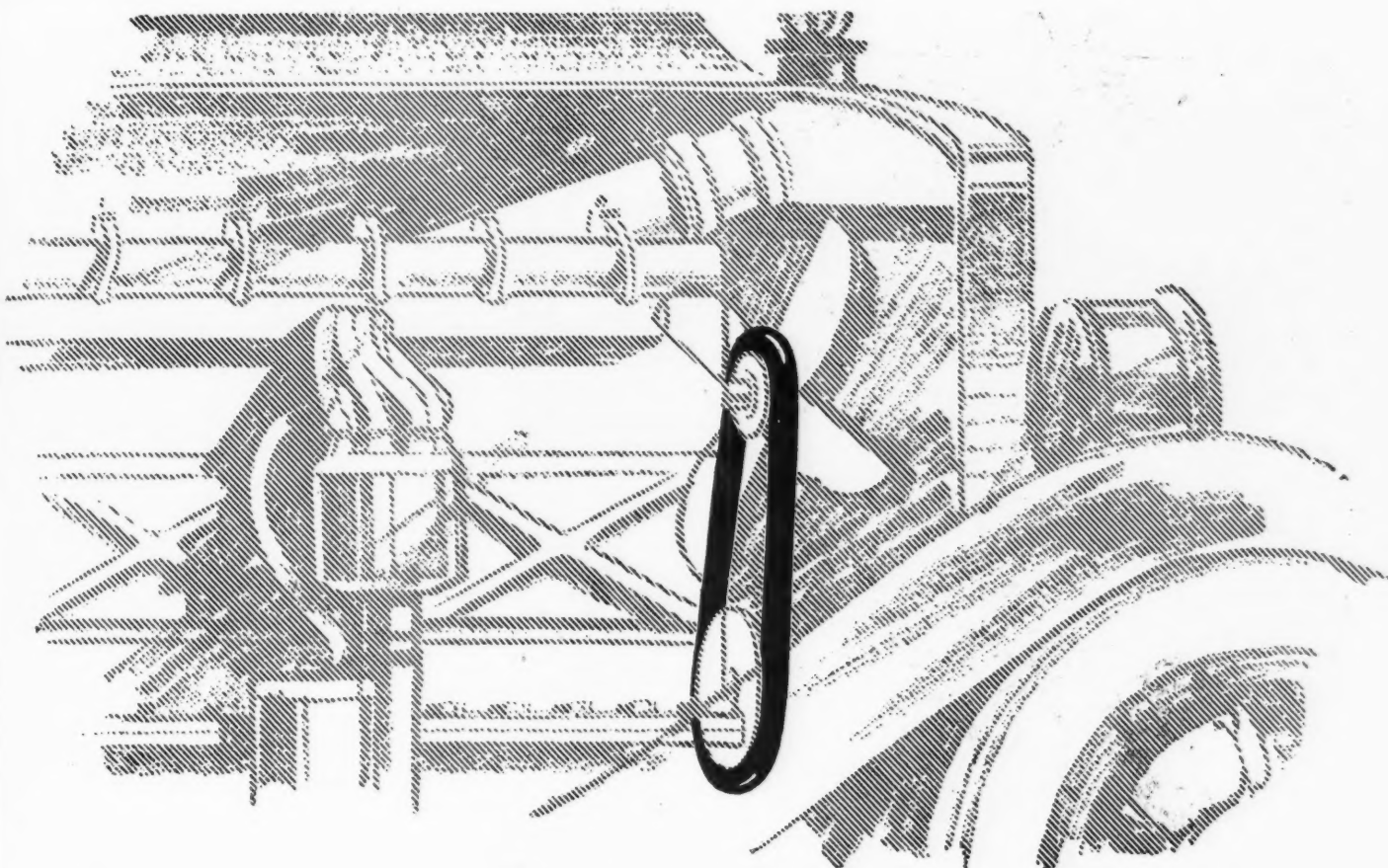
CLEVELAND

PITTSBURGH

PHILADELPHIA

**HYATT**  
*Quiet*  
**Roller Bearings**





# Getting At Fan Belt Facts

The reputation of Rie Nie Fan Belts to outlast all others has been won through their remarkable performance on the job. Their ability to stand up under most trying conditions is due to the rugged in-built quality of the materials that are used in their manufacture.

Rie Nie Flat Type Fan Belts are built like a fine auto tire, ply upon ply of bias woven, rubber saturated fabric. Sealed tight in its special Rie Nie Cover jacket, and then vulcanized into one endless stretchless unit.

Rie Nie Vee Round Fan Belts are built in this same careful way, around a flexible compounded core that flattens out against the pulley sides with a grip of firmness that prevents their ever slipping and assures proper fan speed under all conditions.

There is a Rie Nie Fan Belt for every make of passenger car, truck, tractor and circulating water pump.

**Vee Round for grooved Pulleys.**

**Flat Type for regular or crowned Pulleys.**

**DURKEE-ATWOOD®**  
MINNEAPOLIS, U.S.A.

**Rie Nie**  
Trade Mark Reg.

## Rie Nie Automotive Products

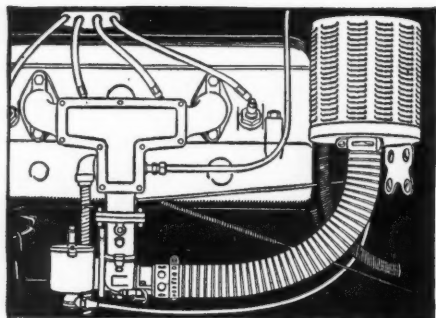
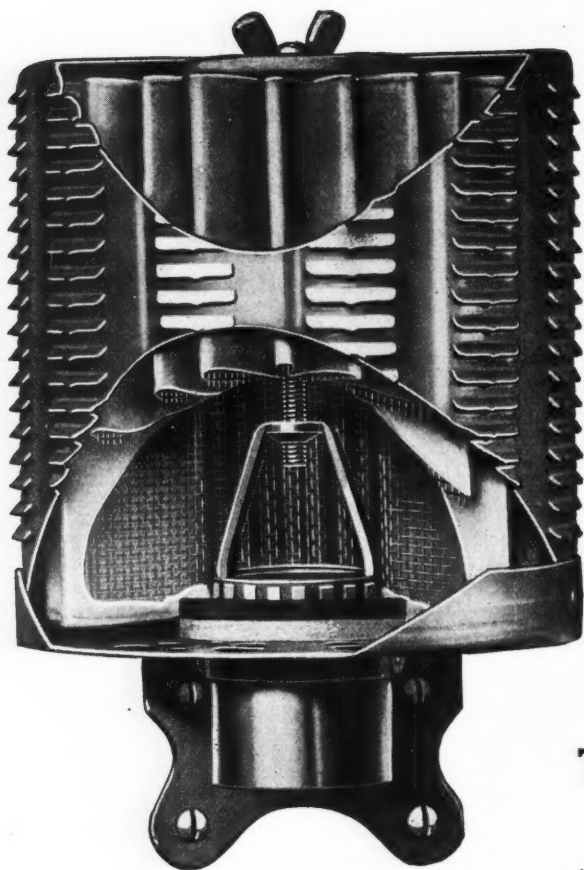
All in One Dressing  
Aluminum Enamel  
Battery Paint  
Bearing Blue  
Clutch and Brake  
Compound  
Enamel (Air Drying)

Enamel (Cylinder)  
Fan Belts  
Gasket Cement  
Graphite  
Leather Dressing  
Metal Polish and  
Nickel Polish

Patch  
Pedal Pads  
Polish—Auto Body  
Radiator Cement  
Orange Shellac  
Radiator Hose

Rim Paint  
Rubber Cement  
Shellac (Gasket)  
Rubber Filler and  
Cement  
Spring Lubricant

Tire Mica and Tire  
Talc  
Tire Paint  
Valve Grinding  
Compound  
Varnish (Clear Auto)



**Typical Installation**

Prominent Manufacturers who use the Protectomotor as Standard Equipment:

Andre Citroen (France)  
 Bean Spray Pump Co.  
 Buffalo Springfield Roller Co.  
 Bucyrus Co.  
 J. I. Case Threshing Machine Co.  
 Clark Tractor Co.  
 Elgin Street Sweeper Co.  
 Fageol Motors Co.  
 Field Force Pump Co.  
 General Motors Truck Co.  
 Holt Manufacturing Co.  
 Ideal Power Lawn Mower Co.  
 International Harvester Co.  
 LeRoi Engine Co.  
 Mack Truck Co.  
 Turner & Moore Engine Co.  
 And many others.

# PROTECTOMOTOR

REG. U.S. PAT. OFF.  
 Perfect Positive Protection

# 99 <sup>9</sup>/<sub>10</sub> EFFICIENT

as shown by the most careful tests  
 conducted at

**THE UNIVERSITY OF CALIFORNIA**  
 By PROF. A. H. HOFFMAN

Prof. Hoffman has developed special testing apparatus and is recognized by the engineering profession as an outstanding authority on the testing of air cleaning devices.

In making such tests a standard dust composed of various road and field dusts is used, such as encountered by engines in actual service. THIS IS VERY IMPORTANT for it has been stated that "Every cleaner built can be made to test out 100 per cent efficient if one only chooses the dust to be fed into it."

THERE IS NO SATISFACTORY SUBSTITUTE for actual air floated dust.

## Efficiency of Protectomotor Proved

When first placed in service, the Protectomotor shows an efficiency of 99.5 per cent. After a few minutes service, the efficiency increases to more than 99.9 per cent.

We invite you to compare other air cleaning devices on the market with the Protectomotor. There can be but one choice. On account of its high efficiency, low resistance to the flow of air, small size, light weight, freedom from requiring attention and elegant appearance you will choose the Protectomotor.

Send for copy of folder giving results of the University of California tests. You will be surprised to learn that some cleaners advertised as being more than 99 per cent efficient really show but little more than one-half that percentage.

## Efficiency Is Important

One engineer with considerable experience says: "An air cleaner worth while considering must be at least 98 per cent efficient." Another well informed engineer states that an air cleaner that is 98 per cent efficient is twice as good as one that is 96 per cent efficient. In one case but 2 per cent of the dust goes into the motor. In the other 4 per cent or twice as much enters the motor to cause wear. Protectomotor, 99.9 per cent efficient, is relatively twenty times as good as a 98 per cent efficient cleaner.

# STAYNEW FILTER

ROCHESTER,

## Sell Protectomotor Equipped Machines



# More than an air cleaner—

## KEEPS OUT ALL THE DIRT

The Protectomotor not only keeps out the coarse particles of sand but the finest dust and grit which cause the most damage. It is more than 99.9 per cent efficient at any motor speed.

## CONTROLS AIR TEMPERATURE

Mounted on the dash and taking in air slowly through a great number of small openings, the Protectomotor delivers air to the carburetor at a more uniform temperature, thus avoiding frequent carburetor changes and giving greater fuel economy.

## MUFFLES CARBURETOR NOISES

The Protectomotor has no moving parts to wear and become noisy. Instead of making a noise it muffles the disagreeable hissing sounds caused by the inrush of air to the carburetor which are so noticeable on some pleasure cars.

## Do air cleaners reduce wear?

See page 13, July Issue, Journal of the Society of Automotive Engineers

"What effect the air-cleaner will have on engine wear is being studied by a number of large commercial organizations using fleets of trucks or automobiles. Only a limited amount of information is available. One engineer reports from Los Angeles as follows: 'Two Buick Six touring cars ran almost exactly 27,000 miles each in the same service. One was without an air cleaner, the other was equipped with one of high efficiency. The average cylinder wear in the first was 0.008 in. and in the second 0.001 in. The engine of the car without the cleaner required several new rings, valves and other parts, the second none. Another engineer reports from New York City: A Model AB Mack truck equipped with a good air cleaner showed 0.0025-in. cylinder wear after 8368 miles of operation. This wear occurred at the extreme top of the ring travel, tapering to no measurable wear 1 in. down. The rod bearings had not been touched in 33,427 miles and showed a clearance of 0.002 to 0.003 in. The wear apparently was all in the babbitt as the pins were still within the original permissible limits.'"

## MEASUREMENTS OF WEAR IN ENGINES WITH AND WITHOUT AIR FILTER

See page 67 July Issue S. A. E. Journal

Tests were conducted by a well known engineer responsible for the operation and maintenance of one of the largest fleets of motor vehicles in the United States. (Name given on request.)

Name of Part	With Filter Inches	Without Filter Inches	Relative Wear
Cylinder Walls .....	0.0011	0.0090	1:8
Pistons .....	0.0005	0.0036	1:7
Upper Ring-Groove Clearance .....	0.0110	0.0650	1:6
Lower Ring-Groove Clearance .....	0.0014	0.0230	1:16
Percentage of Incom- bustible Matter in Carbon .....	6.5000	31.0000	1:5

NOTE: THE PROTECTOMOTOR WAS USED IN EACH OF THE ABOVE TESTS

## Protectomotor is easy to sell—

Union County Buick Company  
431 NORTH AVENUE, WESTFIELD, N. J.

July 2nd, 1924.

Staynew Filter Corp.,  
Rochester, N. Y.  
Gentlemen:—

Herewith find order for two of your Protectomotors Model No. C. 2 for Buick six cyl. 1924.

Later on I will want some for the 1925 Models both for the Standard and Master.

I have used your filters on my last three demonstrators and have nothing but the highest praise for them. I believe your filter is the greatest accessory for the motor ever invented and certainly would not drive a car without one.

I have just installed one on a Buick Sport Touring for a trip to California. It did not take two minutes for the owner to see the merit in the Protectomotor and I could not get it attached any too quick to suit him.

I find that all I have to do in selling these attachments is to detach the cover, take out the filter and show how clean the inside of the pipe is even after months of use, its just as clean as when it came in from the factory.

Yours very truly,  
H. B. BLOUNT.

The Protectomotor is made in proper sizes for all makes of Automobiles, trucks, tractors, air compressors, etc. It is advertised in the leading publications.

Every owner of a machine is a prospect. Make both friends and money by selling Protectomotors.

It will pay you to read the July issue of the Journal of the Society of Automotive Engineers.

# CORPORATION

NEW YORK

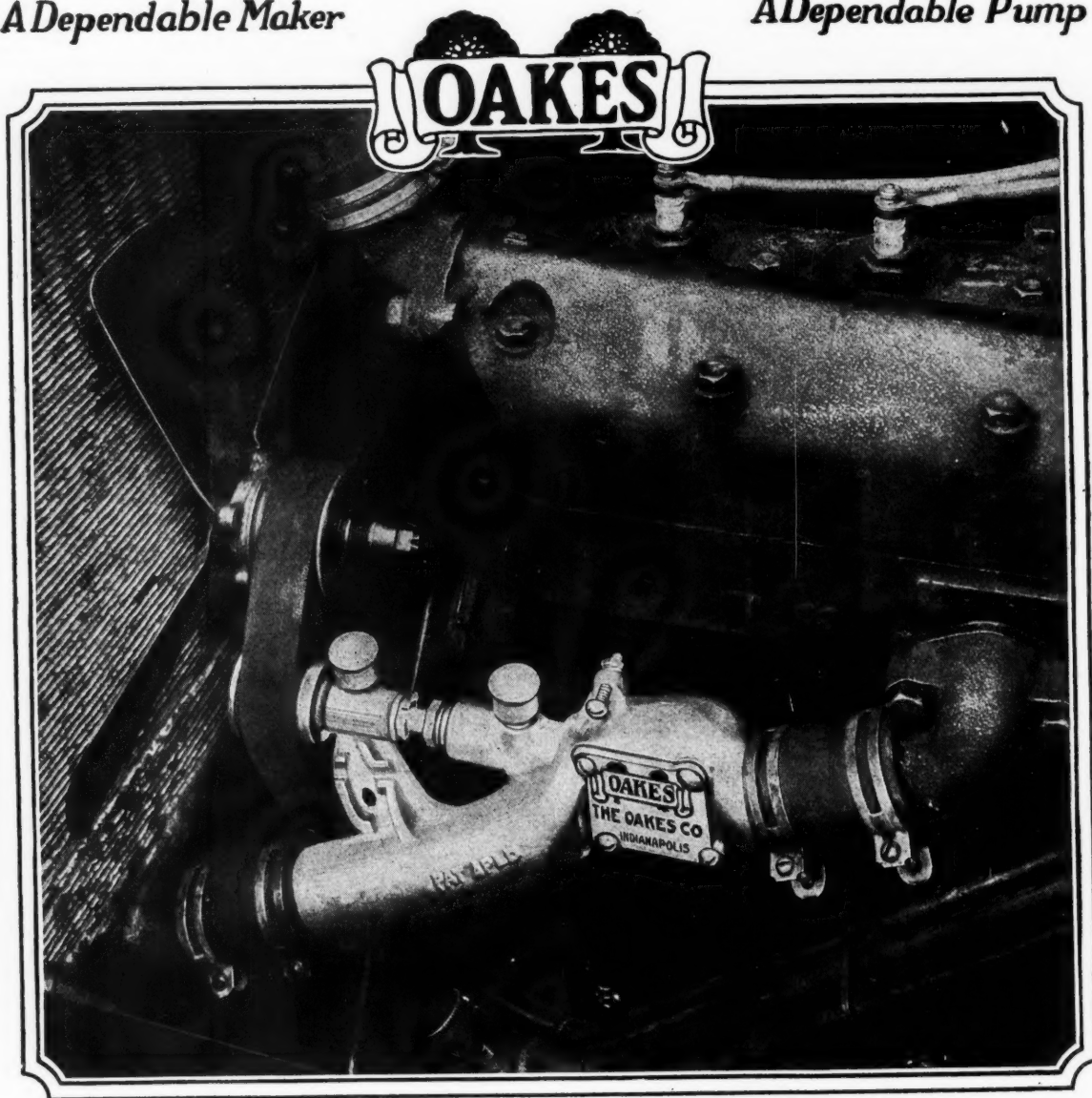
## They will give more complete satisfaction

# *At Last! A Ford Water Pump*

# OAKES

*A Dependable Maker*

*A Dependable Pump*



Backed by Fourteen Years' Study of Cooling Problems



# *That You Can Depend On!*

## WATER PUMP for Fords

**J**UST what dealers and jobbers have long been looking for—an efficient, dependable circulating water pump for Fords, backed by a responsible, amply-financed manufacturer whose reputation merits complete confidence and respect!

The OAKES COMPANY, who have been specialists in automobile cooling problems for 14 years and whose parts and accessories are used on over a million cars, now offer, after thorough and convincing tests, their latest product—the OAKES Water Pump for Ford cars and trucks.

### *A Year-'Round Seller*

In all seasons, in all weathers, in all climates, the OAKES Water Pump keeps the Ford engine *at the most efficient temperature*. It prevents overheating in hot weather and insures immediate circulation in cold weather. It gives the Ford engine the advantages of the same type of cooling system found on higher-priced cars.

✓ **JOBBERs:** Write or wire for a sample. Plan to stock OAKES PUMPS now! Liberal discounts. Tie-up with our aggressive trade paper and direct mail campaign to dealers.

✓ **DEALERs:** SPECIAL OFFER — Cut-away pump mounted on attractive display stand given free with every order for 12 pumps. Order one or more OAKES PUMPS today. If your jobber cannot supply you, we will ship direct, C. O. D., if you desire. Each pump boxed in corrugated carton, 6 to master carton. Wt. 6 lbs. each.

### 10 Points of Superiority

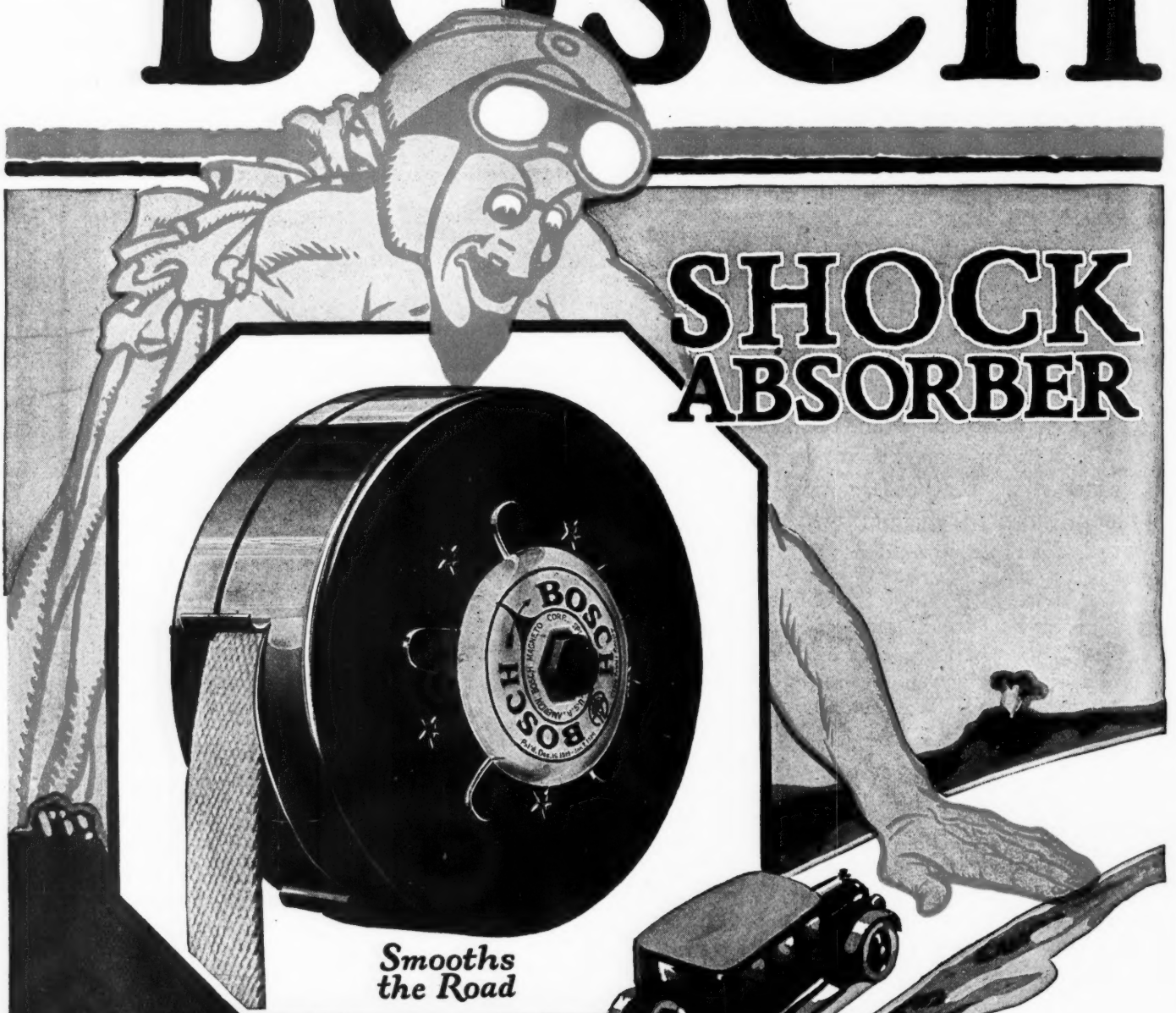
- 1 Operates at proper speed. Correct pressure—enough but not too much. Belt contact right. Low power consumption.
- 2 Uses regular Ford fan belt and hose connections.
- 3 Flexible mounting. Pump held firmly in place but with flexibility which absorbs twisting strains on radiator, engine connections or pump.
- 4 Long bearing life. Made possible by two long bronze bushings at pulley end with grease reservoir between. One of these in line with pulley. Long bearing at impeller end. No strain on packing nut at front of rear bearing.
- 5 Belt stays on. Adjusting screw sets against cylinder block assuring perfect alignment at all times.
- 6 Does not leak. Size of packing chamber and accessible position of packing nut allows liberal take-up and insures long-life without repacking. Best graphite packing used.
- 7 Foreign matter and ice particles cannot clog or injure pipe owing to heavy construction and ample internal clearance.
- 8 Impeller of three-bladed centrifugal type. Circulation assured by low position even with low water level.
- 9 Easily installed without special tools. Easily adjusted, all parts readily accessible.
- 10 Popular price of \$6.50 (7.00 west of Denver) f. o. b. Indianapolis. Made possible by large production. Each pump boxed in corrugated carton, 6 to master carton. Weight 6 lbs. each.

## THE OAKES CO., INDIANAPOLIS, U. S. A.

*Established 1910*

Also Manufacturers of Radiator Cooling Fans, Spare Tire Carriers, Spare Tire and Wheel Locks

# The BOSCH



## SHOCK ABSORBER

*Smooths  
the Road*



**BOSCH  
IGNITION  
SYSTEM  
FOR  
FORDS  
TYPE  
600**

Insures quick, easy starts, clean plugs, added power. Has automatic spark advance—is waterproof. Prevents all ignition troubles. Price, \$12.75.



**BOSCH  
ELECTRIC  
WINDSHIELD  
WIPER**

An absolutely reliable automatic cleaner that is operated electrically. Not affected by engine speeds. Puts no burden on the battery. Price, \$9.50.



**BOSCH  
RED  
SPARK  
PLUGS**

The big sure firing, gas tight plug with the unbreakable insulator and the nickel steel electrodes. Get the genuine—it's red! Regular sizes \$1.00. Ford size 75c.



# Long Line

## For Balloon Tires, Too—

Balloon tires seem to be the "rage"—almost every week brings a new announcement of balloon tires as standard equipment—

But balloon tires have their peculiarities as well as their advantages. They "cushion" wonderfully, but they also develop a peculiar galloping motion at certain speeds.

Bosch Shock Absorbers scientifically correct this. They are the most effective and satisfactory means ever produced for preventing this galloping and swaying motion.

So the tire manufacturers are recommending them, car dealers and owners are installing them, and Bosch Shock Absorber sales are growing by leaps and bounds.

Don't miss this opportunity! If you're not selling Bosch Shock Absorbers, you're missing cash profits every day.

Don't lose any more time—wire for a sample set C. O. D. for the car you sell or drive. Start taking orders right away. This is your best chance to get extra midsummer profits. So wire NOW.

## AMERICAN BOSCH MAGNETO CORPORATION

Main Office and Works: SPRINGFIELD, MASS.

BRANCHES: New York Chicago Detroit San Francisco



### PRICES PER PAIR

For Fords .....\$10

*In Canada \$15.*

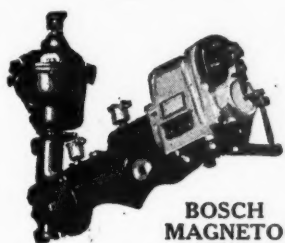
For Medium Cars.....\$15

*In Canada \$22.50.*

For Heavy Cars and Trucks .....\$20

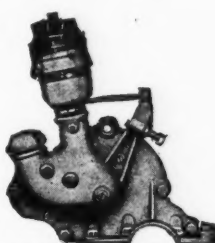
*In Canada \$30.*

Dealers: Big advantages open to live dealers who can become Bosch Sales Agents and sell the Bosch Long Line of automotive necessities. Write today.



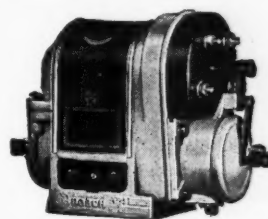
**BOSCH  
MAGNETO  
FOR  
FORDSONS**

Provides Bosch High Tension Magneto Ignition for Fordsons. Eliminates coils and timer. Prevents all ignition troubles. Installed with, or without, the Bosch Throttle Governor. Prices on request.



**BOSCH DE LUXE  
IGNITION SYSTEM  
FOR FORDS  
TYPE 513**

Includes the Bosch Coil, and Bosch Compensating Governor, which automatically advances and retards the spark to exactly meet the Ford engine's characteristics. Wonderfully efficient. Price \$25.00



**BOSCH  
HIGH TENSION  
MAGNETO**

The world's most dependable ignition system—over four million in use today—in demand everywhere for use on cars, trucks, tractors, motorcycles, motor boats and stationary engines. Prices on request.

# Make More Money on Every Armature—

## PRICES

Any Ford  
Armature rewound

**\$2**

ANY TWO-UNIT  
Generator arma-  
ture rewound

**\$5**

You have probably read our advertising for years but hesitated to avail yourself of this service because of "distance." However, thousands of Garages and Service Stations are now regular U. S. Armature Service customers. They are located all over this broad land but the mail bridges the distance.

## FREE!

Our New Armature Data Book containing valuable information on every make of automobile, since the inception of the electric starter, is free for the asking.

### Attractive Business for Distributors

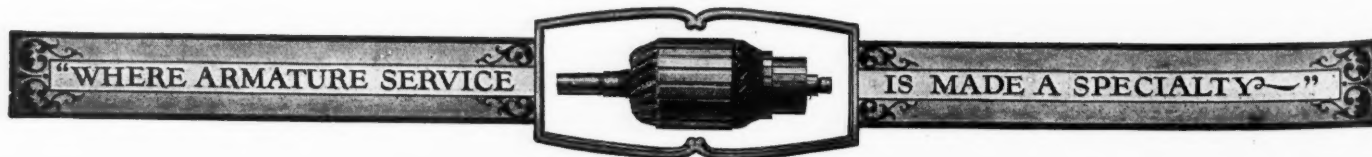
There is a fine opportunity in every community for a U. S. Armature Service Distributor. Write for our attractive plan.

## U. S. AUTO SUPPLY CO.

*Armature Service*

3845 S. Wabash Ave.

CHICAGO, ILL.





# This system has set new standards of motor performance—

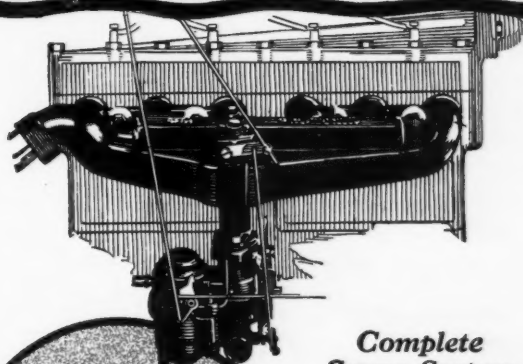
**L**ET'S get this straight right off the bat. The Swan System *is not* just another carburetor. It's a revolutionary forward step in motor carburetion. It does everything we claim for it—and *considerably* more!

This system was first engineered and designed for higher priced cars. Now a model has been especially developed for Fords. On any Ford that is mechanically right, it will save 20 to 30% in gas. But more important—it will make Ford performance amazingly smooth and sweet. It gives that wonderful little motor more power to take the hills on high, and makes it pick up like a six. Nice, easy driving in traffic. Less wear and tear on the transmission, clutch and universal.

And it's all due to a perfect mixture evenly distributed. Unlike other carbureting devices the Swan System does not depend on carburetor performance alone—it provides a proper fuel mixture in the carburetor, and then delivers this fuel in uniform and equal portions to each cylinder.

As a dealer, you know the demand for a system such as this. With the Ford model, and four other special re-installation outfits, you can serve over three cars out of every five. When you see this remarkable system perform, you'll admit that it truly sets an entirely new standard of motor car performance. There is a real opportunity for service stations and dealers who handle Swan Systems. Write us now for more information.

THE SWAN CARBURETOR CO., Cleveland, Ohio  
Subsidiary of The Perfection Heater & Mfg. Co.



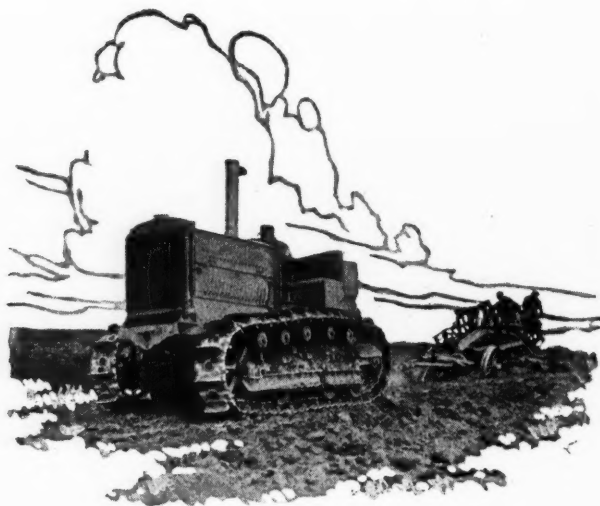
Complete  
Swan System  
for Fords  
**\$18<sup>95</sup>**

Also special models  
for Chevrolets,  
Buicks, Nashes,  
and Oaklands.

*The enthusiastic endorsement  
of automotive engineers is evi-  
denced by the many new models  
of well-known makes which are  
coming out Swan-equipped.*

# Swan System

## Carburetor and Fuel Distributor



## *Everybody wants better roads*

You know what an important factor good roads are, in helping you sell more automobiles. They help every other business, too. Everybody wants better roads.

You see the intimate bond between your business and "Caterpillar" Tractors. You are selling transportation. You have the facilities—the ideal organization—to increase your business by selling also this other great factor in transportation, the "Caterpillar."

You can make your business a better business by selling "Caterpillars." You can diversify it; make it *safer*, without stepping into "something different."

You'll find a most amazing market for "Caterpillar" Tractors. Your

town, your county, your state are probably already "Caterpillar" users. They will buy more. Every large industrial plant; every engineering and earth-moving project; every public utility are prospects. In the oil, mining, lumber and other industries, the "Caterpillar" is the standard. The three sizes — 2-Ton, 5-Ton, and 10-Ton — offer a range of power that meets every need in road making, maintenance, snow removal and hauling.

We are definitely interested in talking to automobile dealers. We can show you in actual figures just what *selling "Caterpillars"* is doing for a large number of mighty successful automobile men. Get in touch with us. Your territory may be open.

THE NATION'S ROAD MAKER

THE HOLT MANUFACTURING CO., Inc.

Peoria, Ill.

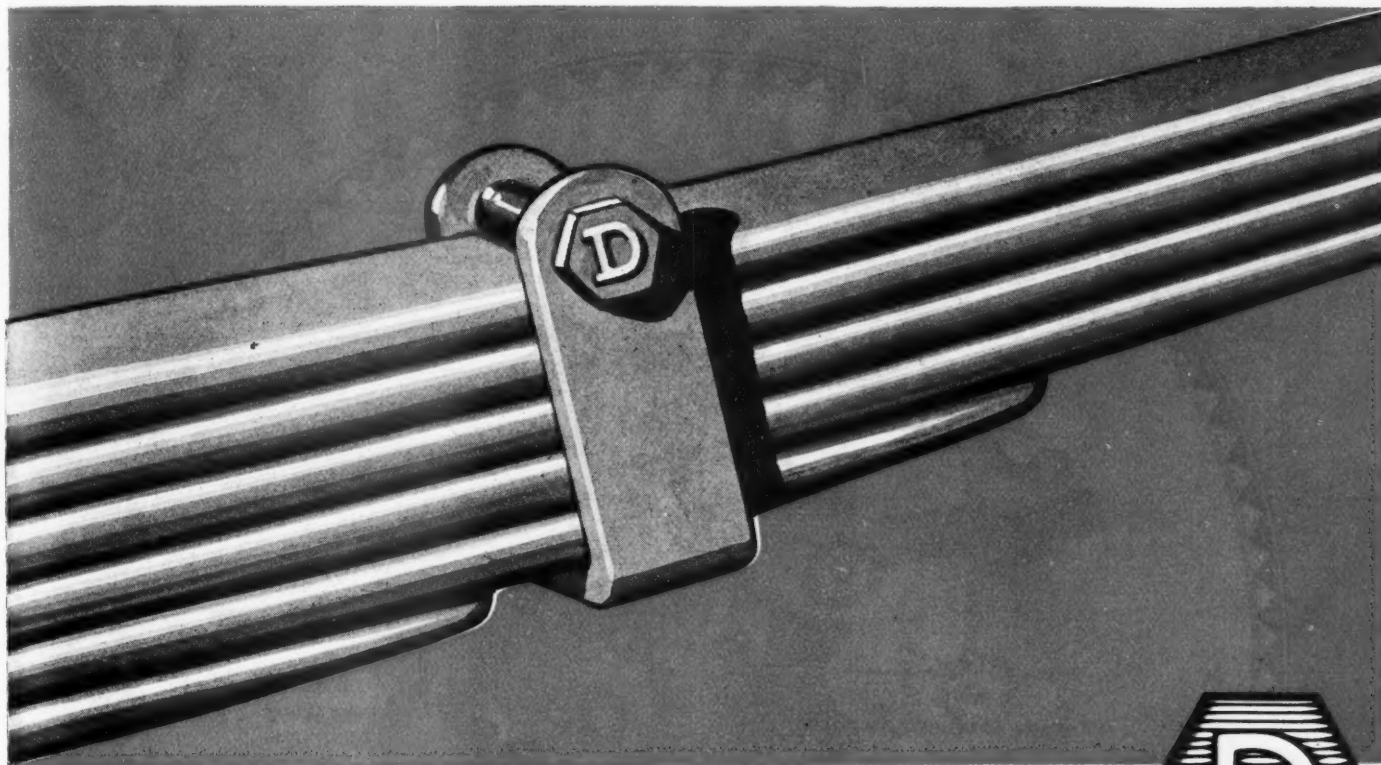
Stockton, Calif.

Export Division: 250 W. 54th St., New York

# CATERPILLAR

Reg. U.S. Pat. Off.





## How To Be Spring Sure

Look for this raised "D" on the springs you buy—you'll find it on the clip bolt head. When you see it you're sure that spring is the best spring you can put under any car—it is a Detroit spring, built to the car maker's specifications, an exact duplicate of the original equipment in every minute detail.

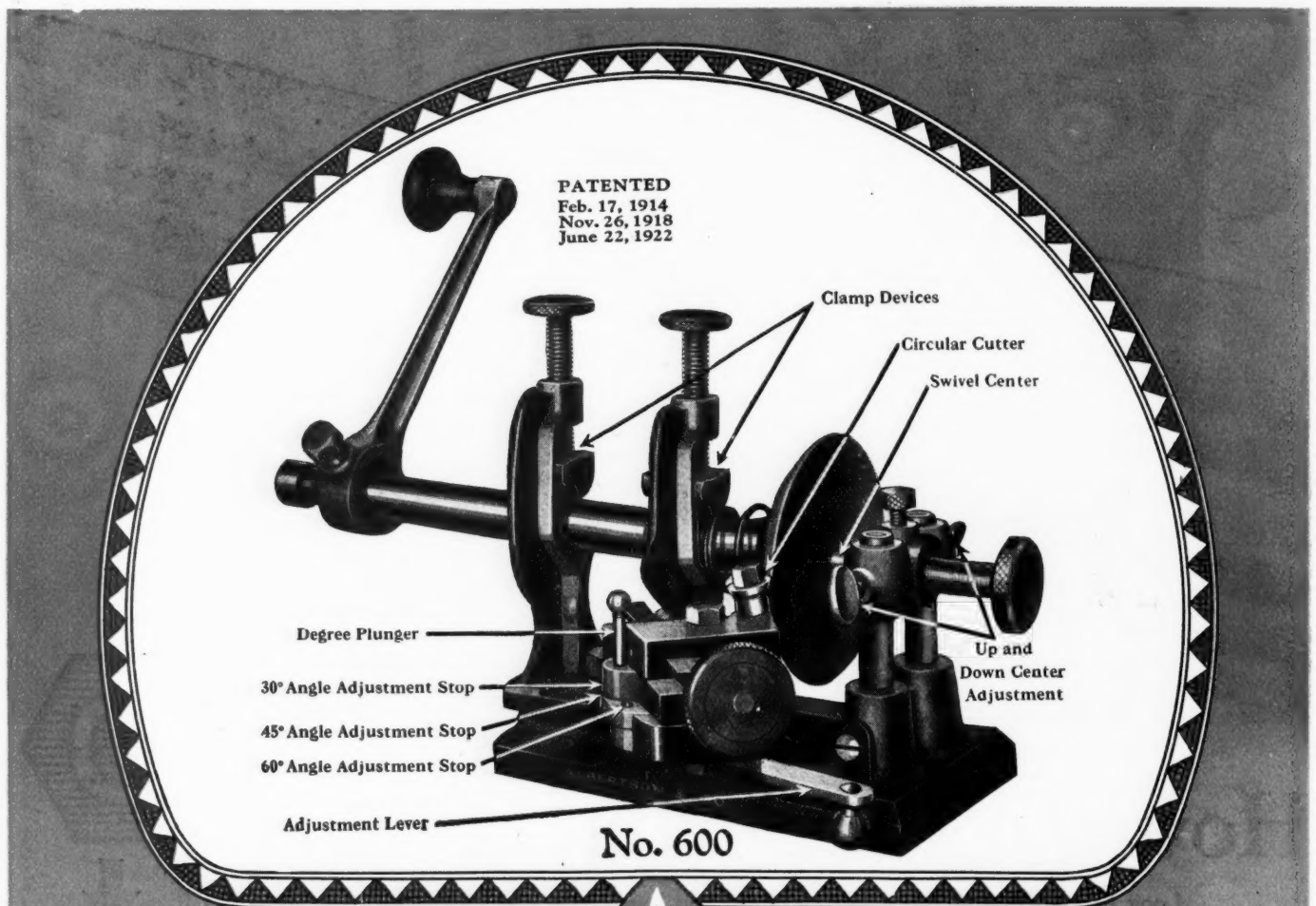
When you replace a broken spring with a Detroit you restore the car as far as that spring is concerned to its original riding quality and long life—you put on an exact duplicate of the spring the car manufacturer specifies for his equipment. Naturally that builds a reputation among car owners—it means repeat business and quick profits.

And the Detroit dealer profits by small investment and rapid turnover. There is a distributor near you who carries a complete stock of Detroit Springs. He can deliver any type or size you want, in a hurry—he carries your stock for you. Write us today for his name and a complete price list.

DETROIT STEEL PRODUCTS COMPANY  
2268 East Grand Boulevard, Detroit, Mich.



**BUILT TO THE CAR MAKERS' SPECIFICATIONS**



SIoux  
Trade Mark Reg U.S. Patent Office

FOR REFACING *big* valves or small ones — *any* valve from  $1\frac{3}{8}$  to  $4\frac{1}{2}$ " diameter, 30°, 45° or 60° angle, — the Sioux Valve Lathe is speedy, efficient and accurate — more accurate than a machine lathe. So simple a novice can operate it. No tedious adjustments. Cutter cannot get out of line. Round cutter insures smooth face on any steel or cast iron valve, without chattering or leaving ridges. Valve is self-centering in lathe. Clamps hold valve in alignment. Lathe will fasten permanently to bench or fit into a vise.

## SIoux VALVE LATHE

Your Jobber Sells It

ALBERTSON & CO.

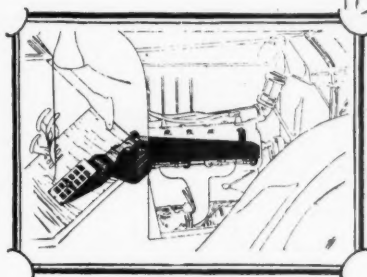
SIoux CITY, IOWA



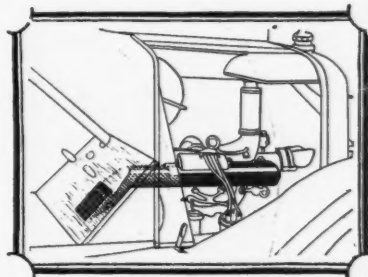


# Stock Kingston Heaters

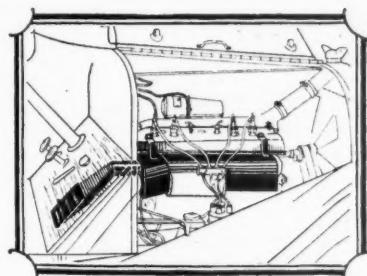
# Now!



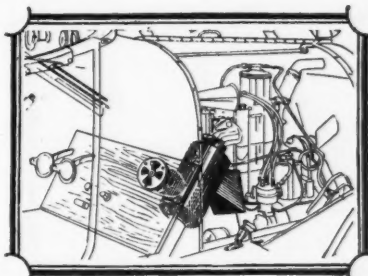
**Ford**  
\$3.75



**Overland**  
\$5.00



**Dodge**  
\$5.00



**Chevrolet**  
\$5.00

THE FAMOUS KINGSTON HEATER will be your best seller this Fall. Get ready NOW for the big demand, which is already under way. Dealers everywhere should stock this splendid, fast selling line. Kingston Heaters this year are furnished for the Ford, Dodge, Chevrolet and Overland.

As always, the Kingston Heater will be backed by a vigorous advertising campaign to the consumer. The Saturday Evening Post will be used throughout the Fall and Winter months, and this will be supplemented with an attractive business getting direct-by-mail campaign. We are telling all of the people all of the time to go to their nearest dealer for the Kingston Heater.

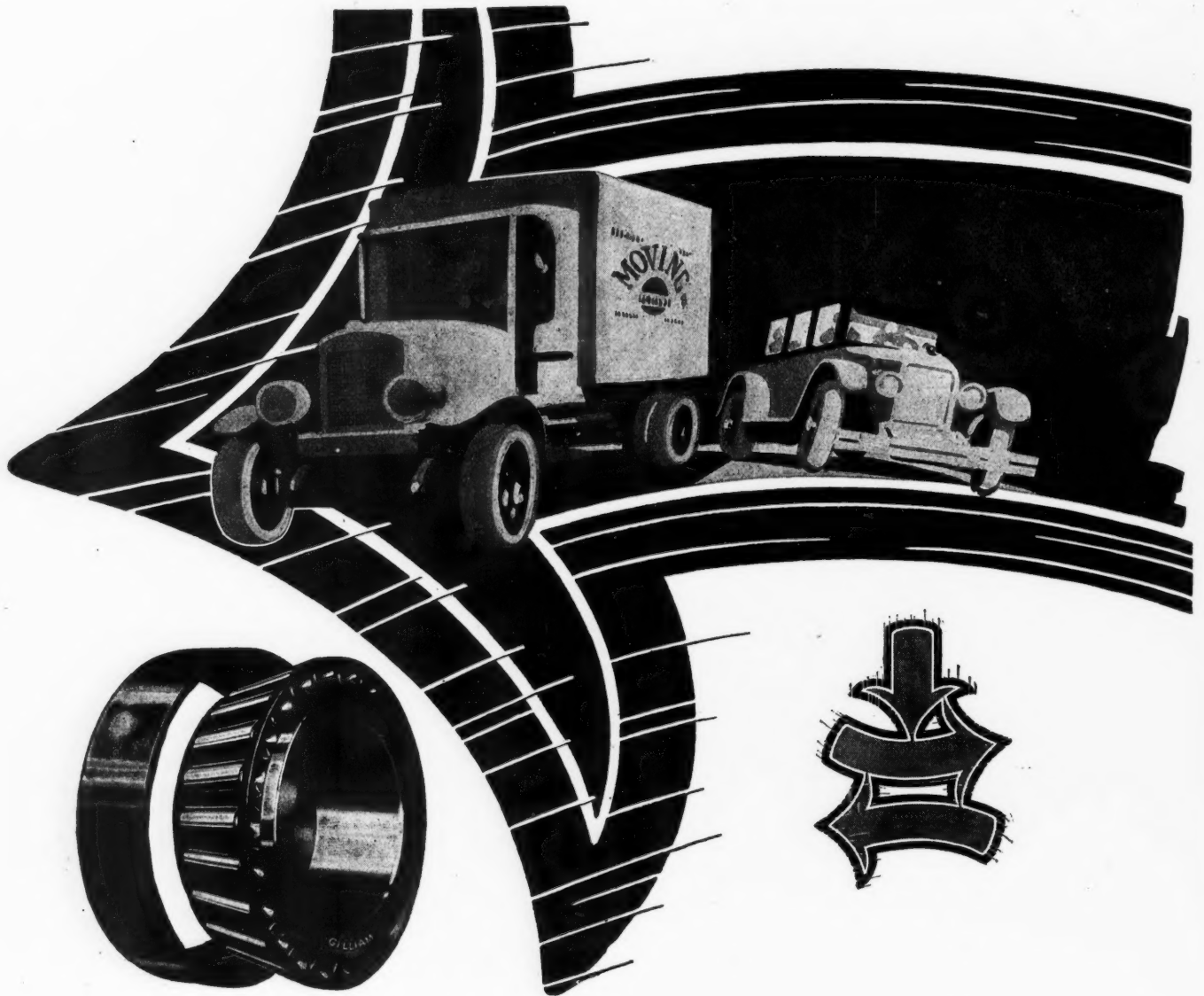
The Kingston line is exceptionally attractive. It has always been a sales leader, and this year it will break all records. Order at once, and be sure to get window and counter displays, folders and other merchandising helps.

This is the high-class low priced line with the liberal margin—a fast seller. Stock early and get the cream of the demand.

**Kokomo Electric Company**  
Kokomo Indiana.

# KINGSTON

# CAR HEATERS



## Your market and your profits are practically unlimited—

Dealers and repairmen are benefitting from the fact that Gilliam Tapered Roller Bearings interchange as complete units with other makes of tapered roller bearings and with certain ball bearing sizes. This means more prospects, more sales and more profits.

Act today. Be the local Gilliam Bearing man. If you don't know your nearest Gilliam distributor, write us direct.


**The Gilliam Manufacturing Company**  
Canton, Ohio

The arrow symbol signifies the recognized ability of Gilliam Tapered Roller Bearings to carry all combinations of radial and thrust loads from all directions.

They are used as standard equipment in 74 makes of passenger cars and trucks.

Gilliam Bearings are made of high grade alloy steel.

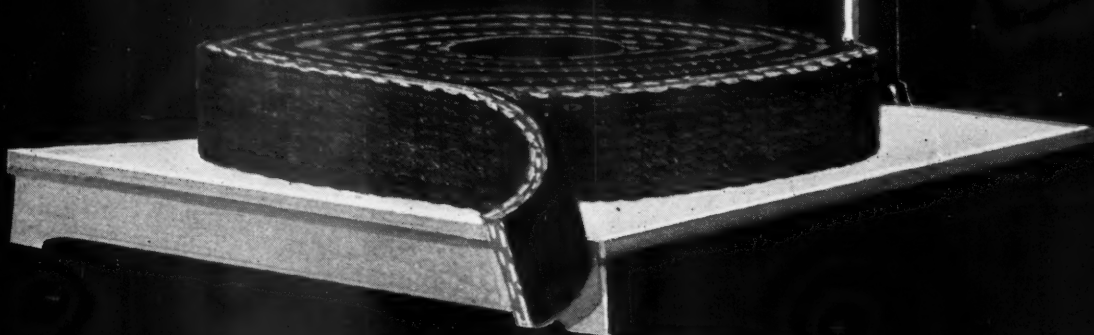
**GILLIAM**  
TAPERED ROLLER  
**Bearings**





# THE HEAVYWEIGHT

*A 40% heavier  
lining with a  
40% longer life*



**Thermoid**  
*Hydraulic Compressed*  
**Brake Lining**



Thermoid Advertising is no "flash in the pan." Month after month, year after year, it has been boosting Thermoid sales.

## The Scales Can't Lie

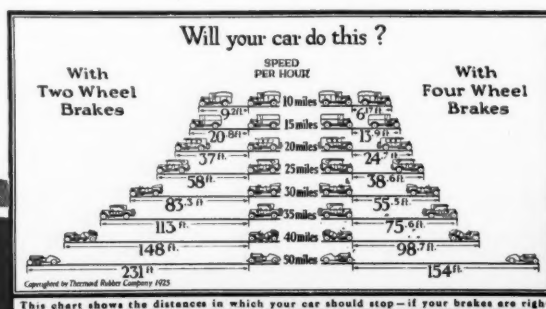
**N**OT if they are your own scales. Ask them whether Thermoid really is the heaviest, closest textured brake lining on the market. Weigh a length of Thermoid against the same size and length of any other lining you please. You will find Thermoid outweighs most other brands from 40 to 54 per cent.

And that extra weight is not just "filling." It is an honest 40 per cent. more of long fibred asbestos, tough copper wire and tenacious cotton.

What's the result? At least 40 per cent. longer wear. Because Thermoid is good until it is worn down to cardboard thinness. As long as brake lining is sold by the foot, not by the weight, Thermoid gives at least 40 per cent. more value for your dollar.

**THERMOID RUBBER COMPANY, Trenton, N. J.**

New York  
Detroit  
Seattle  
Boston  
Cleveland  
Chicago  
Turin  
Los Angeles  
Atlanta  
Kansas City  
San Francisco  
London  
Paris



**MAKERS OF**  
*Rexoid Transmission*  
*Lining, Thermoid Tires,*  
*Thermoid-Hardy*  
*Universal Joints*

# Thermoid

Hydraulic  
Compressed

# Brake Lining





## Tough Chains for Rough Customers

Enter the rough customer. You know him—he carries the well-known chip on his shoulder—he's all set to find faults in any product you show him. But the only thing he'll ever find in McKay Tire Chains is advantages, that even he can't help getting enthusiastic about.

Explain the McKay hardening and toughening process to him. Your rough customer can slam and bang and pound McKays all he wants to, on car tracks, ruts and

pavements. McKay Cross Chains won't break, because they are hard without being brittle—they're *tough*, and they'll outlast ordinary chains by months and miles.

Show him the McKay fastener. He'll have to admit it is easy to use and that it prevents chains coming off when in use.

Get McKays—the tough chains—for your rough customers. Order from your jobber, today.

UNITED STATES CHAIN & FORGING COMPANY, Pittsburgh, Pa.  
Makers of McKay Tire Chains, McKay Shurout Chains,  
McKay Ready Repair Links.

Pacific Coast Sales Representatives  
NORMAN COWAN COMPANY, 451 Rialto Bldg., San Francisco, Cal.

# McKAY TIRE CHAINS

# MCK

# Use Ethyl Gas in *Your Own Cars-*

**P**ROBABLY no motor cars are subjected to as severe usage as are the service cars of garages. They must be ready at every hour of day and night for work that tries their power and endurance. The most efficient automotive fuel in the world is none too good for these cars.





# Then You'll Boost, Too!

Garages that use Ethyl Gas in their own service cars are the most enthusiastic boosters for this remarkable new automotive fuel. If you will give Ethyl Gas just one trial—you will quickly understand the reasons why.

Made and backed by a division of the General Motors Corporation—Ethyl Gas is, without question, the most efficient automotive fuel in the world. It was developed after years of patient research during which more than 2500 substances were tested and proved.

Ethyl Gas completely eliminates fuel "knocks"—and all of the loss of power, waste of gasoline, and harmful effects of carbon accumulation that these "knocks" indicate. It improves the condition of the motor. Even the finest motors will run more smoothly with Ethyl Gas—developing greater power and economy. Using Ethyl Gas, it is seldom, if ever, necessary to retard your spark. Gear shifting is reduced to a minimum.

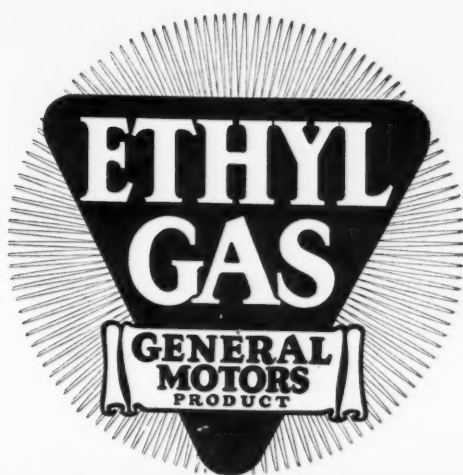
If you sell automobiles—by all means use Ethyl Gas in your demonstrators. Even as an experienced automobile dealer, you will be surprised at the greater smoothness, power and "pep" the motor develops, and how much easier it responds in traffic and on the hills. And your prospect will be delighted.

The quickest and surest way to convince yourself of the unequalled superiority of Ethyl Gas is to try it in your own service cars. A thorough trial will make you a regular user!

**GENERAL MOTORS CHEMICAL CO.**

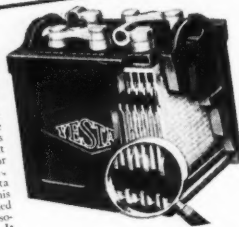
*Subsidiary of General Motors Corporation*

DAYTON, OHIO



# This Book of Facts

## Only Battery of Its Kind

[illegible]

## What the Isolator Does

[illegible]

## What the Isolator Prevents


[illegible]

## Vesta Isolator Batteries

**Vesta Isolator**

The Vesta Isolator Battery is made for every make and model of American car. We illustrate on this page the more popular types, showing them in both wood and rubber cases. The list below will give a complete list of Isolator battery sizes.

**6 Volt 11 Plate (Isolator)**



**6 Volt 11 Plate (Isolator)**

6 DUNN (Wood Case).  
Re-DUNN (Rubber Case).  
For: Ford, Buick 4, Chevrolet, Overland, Durant, Ecor, Maxwell  
Nash 4, Oakland, Cleveland, Gray, Star, Studebaker, Vette and others  
(Isolator)

**6 Volt 13 Plate (Isolator)**

6-DUJY (Wood Case).  
Re-DUJY (Rubber Case).  
For Auburn, Buick 6, Chandler, Durant 6, Hudson, Hupmobile, 1924  
Klein, Nash 6, Oldsmobile, Paige, Reo, Studebaker and others.

12 Volt 7 Plate (Isolator)

R12-DU7Y (Wood Case).  
R12-DU7Y (Rubber Case).  
— for Franklin, Maxwell and others.

[illegible]

## A few facts about Storage Batteries

## A few facts about Storage Batteries

*Their care and repair*

**A STORAGE BATTERY** is a device for storing chemical energy. It does not store electricity as a barrel stores water, but the charging current is converted and stored as chemical energy like so much gunpowder and the circuit only has to be closed to release this chemical energy in a flow of electric current.

Storage battery may be described as a rechargeable or renewable primary cell. There are three types of storage battery: the so-called dry batteries or wet primary batteries or storage batteries, the lead-acid battery, and the alkaline battery.

There are three types of storage battery: the so-called dry batteries or wet primary batteries or storage batteries, the lead-acid battery, and the alkaline battery.

There are three types of storage battery: the so-called dry batteries or wet primary batteries or storage batteries, the lead-acid battery, and the alkaline battery.

At batteries with the electrolyte solution of an aqueous solution of an acid. The electrolyte solution is contained in a plastic container and is sealed. The electrolyte solution is contained in a plastic container and is sealed. The electrolyte solution is contained in a plastic container and is sealed.

[illegible]

### A few facts about Storage Batteries—Continued

Many batteries are burned up in the summer time, not directly because of the atmospheric temperature, although this is a contributing factor, but because of the fact that at this time of the year long tours are made in the daytime. Driving for hours at a stretch on a warm summer day, putting in current into a battery that is overcharged, generally produces ruinous overheating. On such occasions the charging rate should either be reduced or the lights burned during the drive, thus diverting the current from the generator to the lights instead of going into the battery.

### The Charging Rate

### The Charging Rate

In the electrical system on an automobile the battery supplies the current for the starting motor, the lights and the ignition. This represents three items of output from the battery. When the car is running, the alternator recharges the battery at a charging rate that varies with the speed of the car. This charging rate does not vary exactly in proportion to the speed of the car, as there are windings used to narrow the limits of variation, but we can say that on an ordinary 6 volt system the charging rate varies from an order of 6 volt at various speeds.

On most electrical systems there is provided a device which may be fixed at points to increase or lower the charging rate, but there is no system which will allow the maintenance of an even charging rate at all speeds.

battery will vary, the amount of current put into the two cars. For example, one car may be driving continuously on long runs at a steady rate of speed with a heavy charging rate, whereas the other one may drive as many miles at a lower rate of speed with more frequent stops. Then, too, one car may be driven at night when the lights are used, thus diverting some of the charging rate to the lights, whereas the other car may drive altogether in the daytime.

Engineers are therefore obliged to devise their systems for average conditions, and it is up to the driver, the service man to do it for the driver, to set the charging rate according to the conditions as they develop. If a driver finds that he has to have his battery recharged too frequently, the charging rate could be increased. If, on the other hand, a driver never found below 1.35 volts, the rate could be lowered.

The average charging rate for 6 volt systems is 10 to 12 amperes when the car is traveling 25 miles per hour and 5 to 6 amperes for a 12 volt system at the same speed.

## Dangers of Cold Weather

### Dangers of Cold Weather

Previously in this article we have given the freezing point as gravity at which the electrolyte will freeze. In freezing, the electrolyte acts the same as all other liquids, which is to expand, causing breakage of jars, etc. Besides this, the active material loses its character by freezing, and even when the jars are replaced the active material will slough off rapidly in service. It can be seen from the table that there is very little danger of the battery freezing if it is kept fully charged.

A storage battery does not freeze.

temperatures is at high temperatures. This is obvious when it is remembered that it is a chemical action that produces the current. All chemical actions are slowed by reduced temperatures. With a reduced output from the battery and much harder cranking job (because of stiff engine) it is natural that starting troubles will multiply in cold weather.

### Essentials to Good Battery Performance

- [illegible]



# s Makes Battery Selling Easy

## Yours For the Asking

Everyone who is interested in good battery service will appreciate this book, which we have compiled with the knowledge of 27 years of battery building and selling.

Naturally it tells all about Vesta Batteries but it also contains a fund of valuable information on batteries in general. Battery specifications for all cars are listed. In short—IT IS A TEXT BOOK of the industry. It is mailed FREE to the trade upon receipt of the coupon properly filled out.

**VESTA BATTERY CORPORATION**

Chicago, Ill.

# VESTA

**COSTS LESS PER MONTH OF SERVICE**



No Other Battery  
Has Them

Indestructible  
Isolators Lock the  
Plates Apart

### "Vesta Centrals"

ALBANY MOTOR SPECIALTY CORP.,  
109 Lexington Ave., Albany, N. Y.  
SOUTHERN MOTOR EQUIPMENT CO.,  
216 Spring St., Atlanta, Ga.  
BOICE MOTOR EQUIPMENT CO., 562  
Commonwealth Ave., Boston, Mass.  
VESTA BATTERY SALES CO., 21st St.  
at Chester, Cleveland, Ohio.  
TENNANT BROS., Dallas, Texas.  
EQUIPMENT SERVICE CO., 13th at  
Lincoln, Denver, Colo.  
AUTO ELECTRIC & SERVICE CORP.,  
91 Selden Ave., Detroit, Mich.  
THE FAETH CO., 1117 W. 8th St.,  
Kansas City, Mo.  
MCLELLAND - FELTHOUSE CORP.,  
1358 S. Figueroa St., Los Angeles, Calif.  
REINHARD BROS. CO., 11 S. 9th St.,  
Minneapolis, Minn.  
WALTHER BATTERY SERVICE CO.,  
867 St. Charles St., New Orleans, La.  
P. J. DURHAM CO., 244 W. 49th St.,  
New York, N. Y.  
OMAHA BATTERY COMPANY, 2212  
Harney St., Omaha, Nebr.  
J. H. McCULLOUGH & SON, 257 N.  
Broad St., Philadelphia, Pa.  
AXWELL EQUIPMENT CO., 240 2nd  
Ave., Pittsburgh, Pa.  
SALT LAKE HARDWARE CO., Salt  
Lake City, Utah.  
EQUIPMENT SERVICE CO., 2631 Lo-  
cust St., St. Louis, Mo.  
WATERHOUSE & LESTER CO., 540  
Howard St., San Francisco, Calif.  
SPOKANE BATTERY & IGNITION CO.,  
1201-3 W. Sprague Ave., Spokane,  
Wash.

## BOOK COUPON

Vesta Battery Corporation,  
2100 Indiana Ave.,  
Chicago, Ill.

Send the Battery Book to:

Name.....

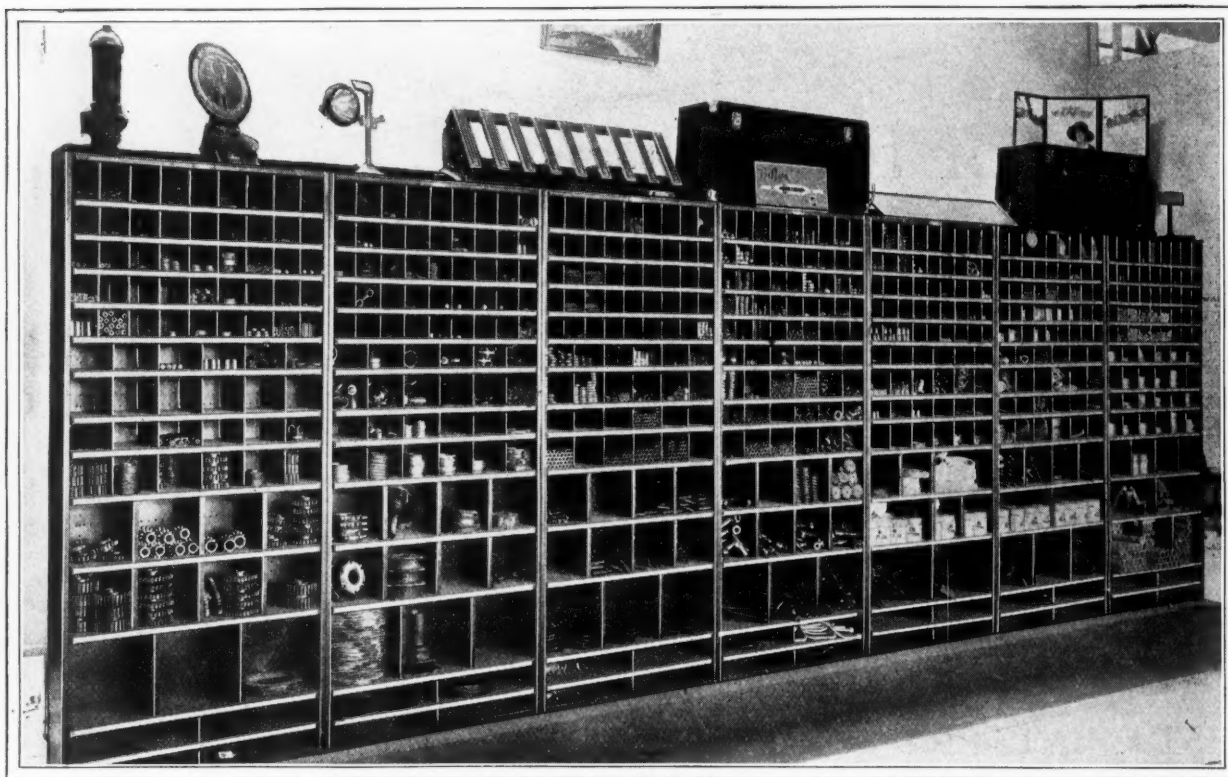
Address.....

City.....

Firm Name.....

M. A.

# LYON AUTO PARTS CONTROL



## Better Order *means* Better Orders

"Everything in its place"—is easy to have with the Lyon Auto Parts Control System.

With the Lyon system you can make your repair parts business an attractive, presentable feature of your trade, with good display and a considerable saving of valuable floor space to devote to profitable showing of other merchandise.

The Lyon Auto Parts Control System enables you *quickly* to lay hands on any wanted article. That pleases customers and gives your stock man more time for other work. Supplies that need replenishment are observed and

replaced before you have to say, "Sorry, we haven't any right now." Inventory is made a simple job.

There is a Lyon Auto Parts Control System that is especially designed for your type of business. If you will write us about your stock and the cars you service, we shall be glad to suggest a system for you, whether your requirements be small or large.

Our years of experience in locker, shelving and steel cabinet manufacture is at your disposal. Use us.

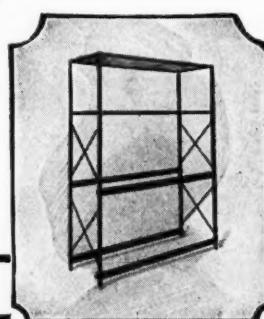
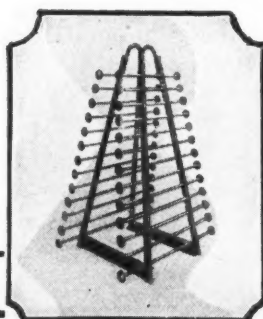
## Lyon Metallic Manufacturing Company

Aurora / Illinois

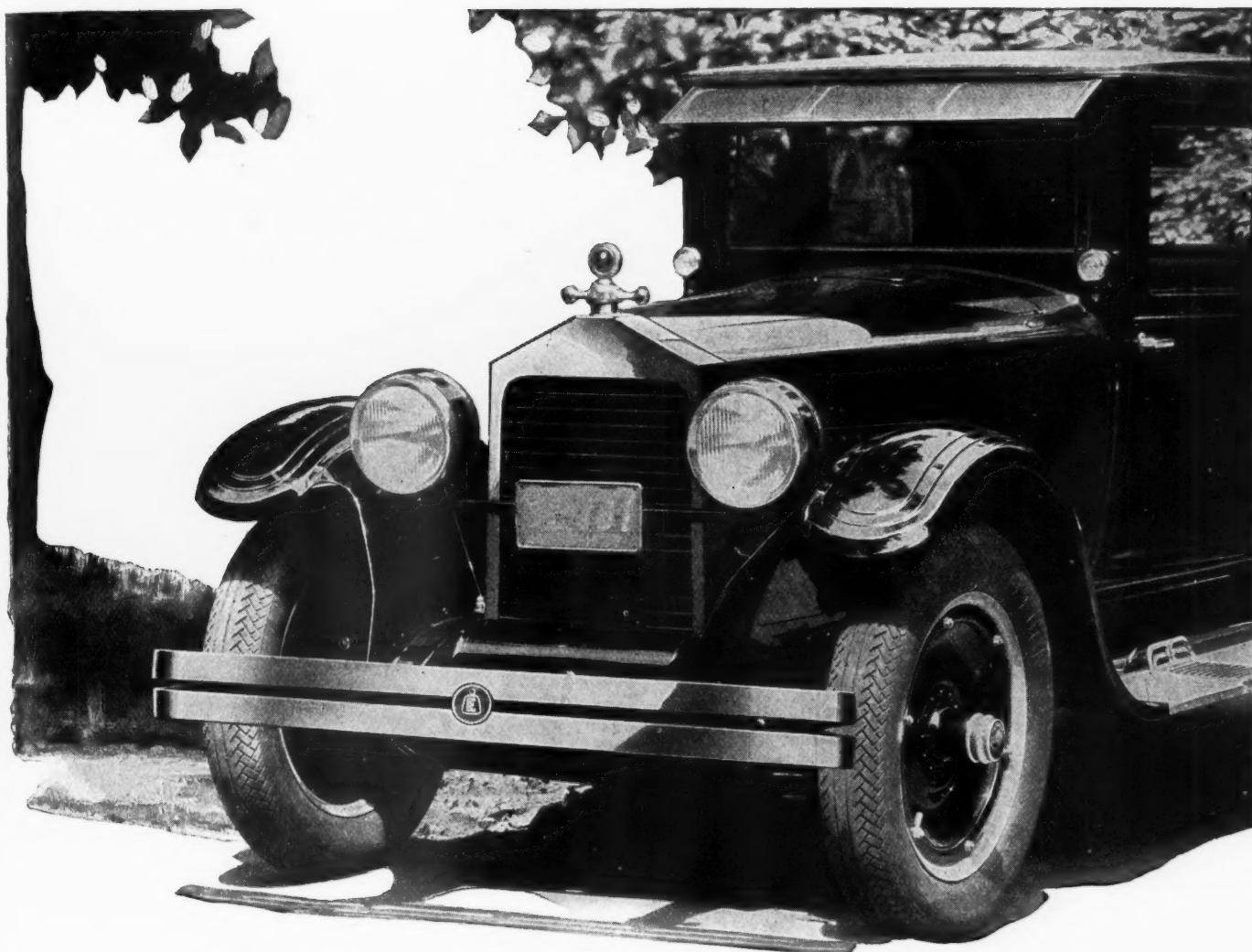
Lyon Auto Parts Control Systems are sold by  
leading Automotive Jobbers



*for every storage need*







## "Accessory Before the Fact"

ANY intelligent motorist is "sold" on a good bumper *before he buys his car.*

And that sale means increased profit to YOU.

Your job is simply to *have the good bumper*, well displayed. And remember, two bumpers can be sold as easily as one, and the profit is double.

Eaton Bumpers are the ideal line for you to carry. From the famous EXCALIBUR at \$40, to the "Single-bar" at \$11.00, the Eaton line

covers every requirement of the most fastidious buyers. Tight-Wad or Sportsman, Miser or Millionaire, you can suit them all—perfectly.

A widespread preference on the part of owners of the better cars for the handsome model illustrated here leads to many profitable sales.

Eaton Bumpers are easily and quickly installed, from the "Gard-All" for light cars, to the "Bumperets," now available with special fittings for nearly all makes of cars.

THE EATON AXLE & SPRING COMPANY, CLEVELAND

NEW YORK  
616 W. 56th St.

BOSTON  
162 Brookline Ave.

PHILADELPHIA  
223 N. 22nd St.

CHICAGO  
2933 Calumet Ave.

ALBANY  
No. Pearl and Van Woert

CLEVELAND  
6515 Carnegie Ave.

# EATON

## BUMPERS



## IF EVERY CUSTOMER HAD LOTS OF PATIENCE and IF YOU HAD PLENTY OF TIME

It *might* be all right to wade through a miscellaneous pile of belts in the hope of finding one that *might* fit, that *might* give good service *if* it did fit—and then to figure a price that would show a profit “*if and when*” there is a profit but “life’s too short.”

## SAVE YOUR CUSTOMER’S PATIENCE and SAVE YOUR TIME

By stocking a line of belts where it takes a minute or less to find just what is needed, where you *know* the belt will fit and give service, where the standard price *insures* a very good profit for you and where there are no “hang-overs” of shop-worn stock to eat up the profits you thought you had.

### *Gilmer* Super-Service Fan Belts

(Made both in Flat and Moulded “V” Type)

are branded with the group size, are packed in individual cartons, labelled to show exactly what makes, years and models of cars that group size will fit. The Gilmer Catalog shows the specifications by groups and alphabetically by cars.



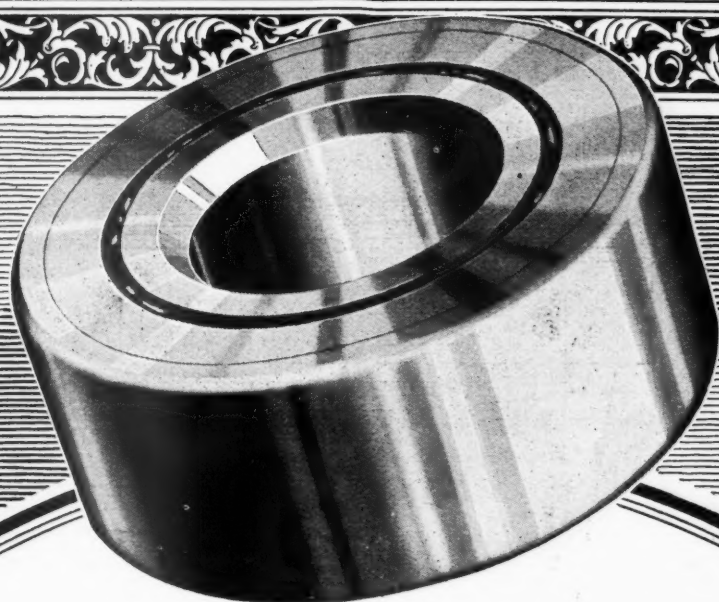
### MOST IMPORTANT OF ALL

These belts are giving increased service to car and truck owners. Do you see the solid foundation for profitable business? What your customer wants—when he wants it—and the kind of service that brings him back to you when again in need.

Write for full information on our Stock & Display Cabinet furnished without extra charge with standard assortments. It's a “ready-made” Fan Belt Department.

**L. H. Gilmer Co.**  
Philadelphia





# New Departure Ball Bearings

## New Departure's "Double Row" Type

### *The Bearing with all the Advantages*

Triple function. Capable of sustaining radial loads and thrusts in both directions in any combination.

Unit construction. Non-separable. No adjustment possible or necessary.

Non-wearing, because "ball bearings do not wear."

Capable of high speeds and heavy duty.

Perfect rolling action *in actual practice*.

Economical. Saves space, time and labor of assembly.  
(No spherical seated washers required.)

Efficient. Reduces friction to a minimum.

*Made in the largest and most modern precision bearing manufactory in the world. Bulletins on the theory and practice of angular contact ball bearings mailed upon request.*

The New Departure Manufacturing Company, Bristol, Connecticut  
Chicago, Detroit

**CLIP and MAIL**

The Fostoria Pressed Steel Co.,  
Department B,  
Fostoria, Ohio.

Send me your free booklet on Fender  
Replacement Marketing.

Name.....

Address.....

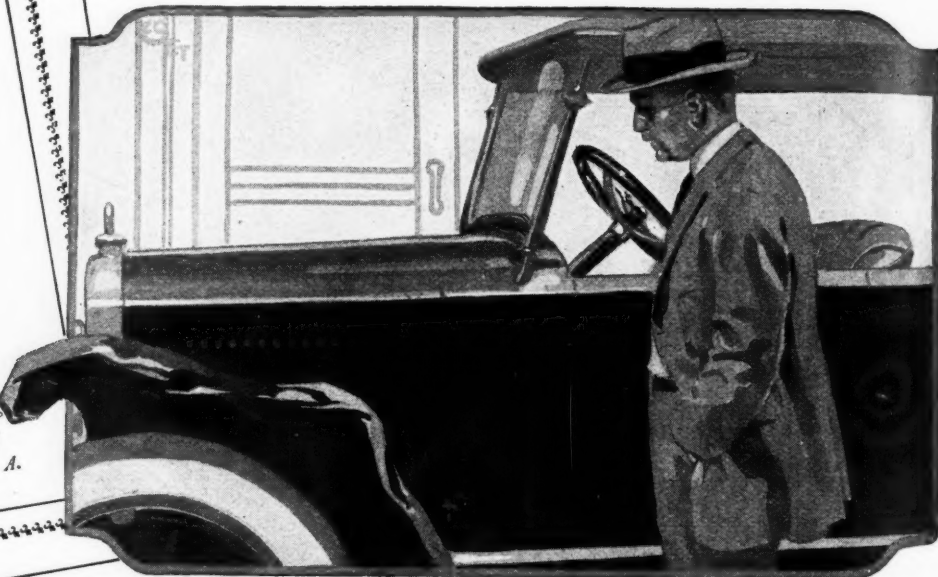
M.A.

*This little book tell you more about  
how to make money than you can  
learn in a life-time spent plugging  
away at some of the over-sold propo-  
sitions you are trying to shove into your  
market.*

**FOSTORIA  
FENDERS**



Manufactured by  
**THE FOSTORIA PRESSED  
STEEL COMPANY**  
Fostoria, Ohio, U. S. A.



## You Know Enough About the Frequency of Fender Replacement—

### *This Book Tells You How to Make It Pay*

**W**HEN you glance through this little book on fender replacement you will see a wide open door to a bigger profit opportunity than you had believed to exist in the whole field of automotive service.

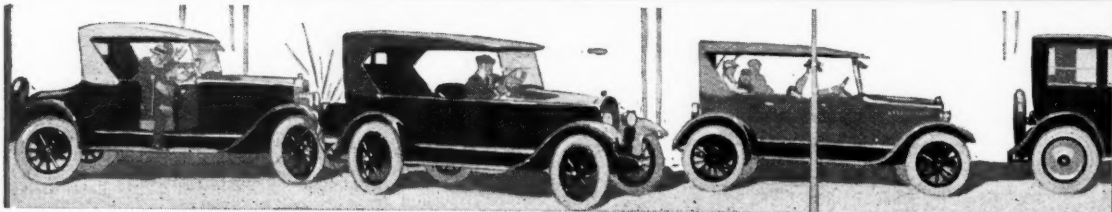
Other lines of automotive service and replacement are already crowded, but fender replacement offers a tremendous volume of immediate, profitable business everywhere to the man who sees and seizes the opportunity. Get the book. Get this new profit.

**THE FOSTORIA PRESSED STEEL CO., Department B, FOSTORIA, O.**

*Replace with*

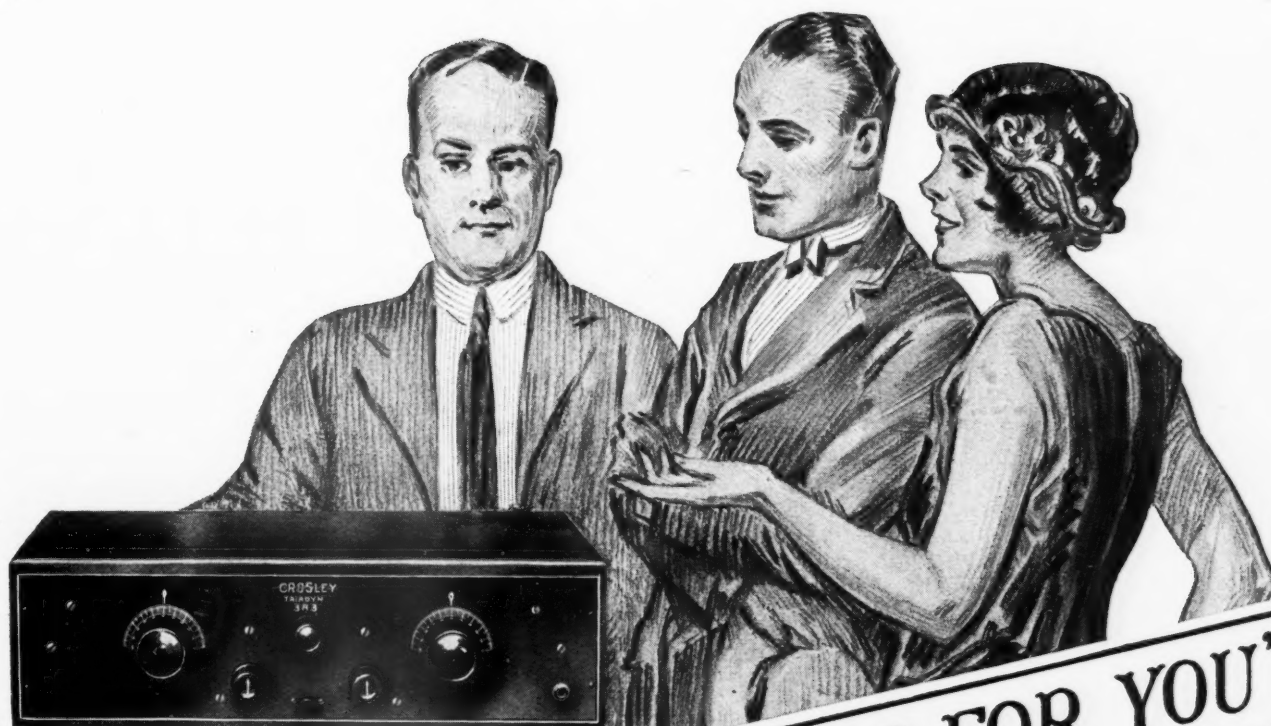
# FOSTORIA FENDERS

Fender damage is the most frequent casualty of automobile operation today.



Fostoria Fenders squarely meet this need for a low priced, high quality replacement.





**"HERE'S the RECEIVER FOR YOU"**

#### REGENERATIVE RECEIVERS

Crosley 50. One tube set consisting of regenerative detector and tuner .....\$14.50

Crosley 50-P. The Crosley 50 in a quartered oak portable case with battery space, etc.....\$18.00

Crosley 51. Two tube set consisting of regenerative detector, tuner and one stage of audio frequency amplification .....\$18.50

Crosley 51-P. The Crosley 51 in a leatherette covered portable case with battery space, etc. ....\$25.00

Crosley 52. Three tube set consisting of regenerative detector, tuner and two stages of audio frequency amplification .....\$30.00

Crosley Trirdyn 3R3. Incorporating radio frequency amplification, regeneration, reflex and additional audio frequency amplification. Three tubes giving the efficiency of a four or five tube set .....\$65.00

Crosley Trirdyn Special. The Trirdyn 3R3 set in a larger, more handsome mahogany case with battery and accessory space included.....\$75.00

#### RADIO FREQUENCY RECEIVERS

Crosley Model VI. Two tube set incorporating radio frequency amplification, detector and tuner .....\$24.00

Crosley Model X-J. Four tube set incorporating radio frequency amplification, detector, tuner and two stages of audio frequency amplification.....\$55.00

Crosley Model X-L. The Model X-J rearranged and mounted in console cabinet with loud speaker built in .....\$120.00

*Prices given are without accessories.*

Crosley regenerative receivers are licensed under Armstrong U. S. Patent 1,113,149.

Crosley owns and operates  
Broadcasting Station WLW.

Confidently, with real pride, the dealer that enjoys a Crosley Franchise will many times a day, repeat that phrase.

Because they are so well known through continued satisfactory performance and national advertising, he knows that Crosley Radio Receivers offer the least sales resistance. From past experience, he realizes that a Crosley sale means an added friend and continued customer.

Within the Crosley Line of Radio Receivers, there is one to suit every taste and pocketbook. If you handle Crosleys, every prospect may be quickly and easily converted into a purchaser. Why neglect the opportunity for added profits that Crosley Radio Receivers and Parts offer you. Look at the make-up of the instruments and the low prices as listed here. Then picture the large Crosley business that you can do.

**Decide Today to Standardize on This Complete Line**

*For Sale by Good Jobbers Everywhere*

**CROSLEY**  
Better-Cost Less  
Radio Products

*Write for Complete Catalog*

**THE CROSLEY RADIO CORPORATION**

*Powel Crosley, Jr., President*

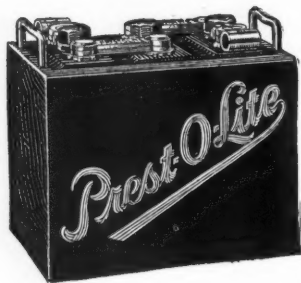
**8533 ALFRED STREET**

**CINCINNATI, O.**



## What's in a Name?

Each and every Grid is inspected in the Prest-O-Lite Plant before being accepted for assembly.



What kind of a battery is it? That's what your customers want to know. If the battery you sell them bears a name they know—a name that stands for unfailing dependability—the sale is easier to make and the customer is satisfied. Every Prest-O-Lite Battery that leaves the factory has back of it twenty years of experience in the skilled manufacture of dependable products.

The name Prest-O-Lite and what it stands for in starting and lighting batteries, is being nationally advertised. Above are shown some of the magazines through which the story of Prest-O-Lite quality reaches twenty million people through every advertisement. The name Prest-O-Lite is a positive business asset to both of us.



The Sign of  
"Friendly Service"  
Service Stations  
Everywhere



**RADIO** For radio satisfaction recommend Prest-O-Lite Super-Service "A" and "B" Storage Batteries.

**THE PREST-O-LITE COMPANY, Inc.**  
INDIANAPOLIS, IND.

New York: 30 East 42nd St. Pacific Coast: 599 Eighth St., San Francisco  
In Canada: Prest-O-Lite Company of Canada, Ltd., Toronto

# Prest-O-Lite

THE OLDEST SERVICE TO MOTORISTS



# GATES HOSE

*"The Standardized Radiator Hose"*



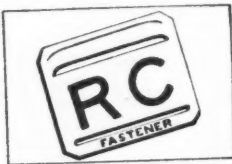
Marked by Inches  
Easily Cut to Length

It's the yardstick on  
Gates Vulco Hose—  
and the chart of sizes  
in every box—that  
have taken the fuss  
and trouble out of  
selling radiator hose.

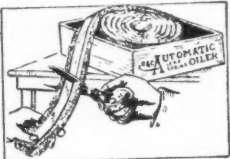
Made by the World's Largest  
Manufacturers of Fan Belts.



### Clean Spring Well Before Applying



Showing R. & C. Patented Fastener, (Upper) — double slotted and (Lower) single slotted ends.



Dealer cuts Oilers from the Roll to size for each end of the spring.



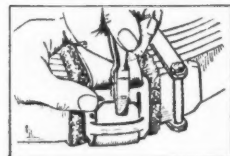
Insert zinc band in single slotted end just  $\frac{1}{4}$  inch.



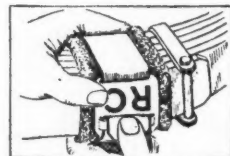
Then bend  $\frac{1}{4}$  inch of zinc band back tight against end of fastener. Tap with hammer.



Place fastener on bottom of spring, bring oiler over spring complete and insert other end of zinc strip through double slotted end.



Take pliers and pull zinc band through precisely as illustrated thus tightening Oiler to the spring.



Then bend zinc strip back with thumb and tap down with hammer.

## Big Car—Little Car—Trucks of any size fitted with automatic spring leaf lubricators from one roll of R. & C. Oilers

That's the big feature about the R. & C. Oiler—COMES IN ROLLS 30-ft. LENGTHS, ONE WIDTH AND ONE THICKNESS ONLY. No stock worries nor investment worries—from one roll of R. & C. Oiler, you can equip from six to ten cars; any car or truck, from Ford to Mack, from Chevrolet to Cadillac, with R. & C. method of constant, automatic spring leaf lubrication, second to none in efficiency—lower than any other in price!

After installation you may rest assured that satisfaction will follow because—R. & C. Oilers can't rattle, have no nuts, bolts or laces to loosen to give trouble and will outlast the car.

Apply oil once a month, and R. & C. Oilers will provide perfect riding comfort, stop squeaks, reduce wear and tear on tires and car and almost eliminate spring breakage.

No installation troubles, as the illustrations show—a service easy and profitable to render. R. & C. Oilers are cut to proper length from the roll, by the dealer and attached to each end of the spring.

List price \$25.00 per Roll—7 cents per inch.

Equipment for Ford \$2.00; Dodge—\$4.76; Packard—\$4.76; Buick—\$5.46. Other prices in proportion. Liberal discounts to the trade.

**R. & C. PATENTED FASTENERS ARE INCLUDED WITH SHIPMENTS AT ABOVE PRICES.**

Spring data furnished with each roll to the dealer. If your jobber cannot supply you we will ship you direct.

Place your order now. One roll is a dealer's complete stock.

EXCLUSIVE DISTRIBUTORS WANTED

**R. & C. MANUFACTURING COMPANY**

Exclusive Manufacturers of

**R. & C. AUTOMATIC SPRING LEAF OILERS**

(Protected by Basic Patent No. 1454116. Infringements will be prosecuted.)

**PARKERSBURG, W. VA.**





## Electric Cable For Every Automotive Use

No one questions the fact that it pays to standardize on parts and many of the better shops have found that there are even more reasons for standardizing their electric cable purchases.

A great number of these good shops use nothing but "PARANITE" cable because they have found it to be a "good buy" and because there is a "PARANITE" cable best suited for every automotive job.

### IF IT'S **PARANITE** IT'S RIGHT

Since the earliest days of the automobile, we have been studying automotive needs and in these years have successfully developed the best cable for each particular use.

Production methods and volume have always made it possible to keep prices so moderate that there is little excuse for using anything else but PARANITE.

Charging and Storage Battery Cable—Horn and Lamp Cord—Lighting Cable—Limousine Cord—Low Tension Cable—High Tension Cable—Spotlight Cord—Starting Cable.

Leading Jobbers everywhere carry complete stocks.  
Your Jobber can deliver.

**Indiana Rubber & Insulated Wire Co.**  
Jonesboro, Ind.

A. J. Musselman  
549 W. Washington  
St., Chicago, Illinois

Geo. R. Hall  
West Hartford,  
Conn.

*Making good cable in Jonesboro  
for more than 34 years.*



# NEW U.S. BENCH GRINDER!

*Easy to remember the price—*  
**ONE CENT PER REVOLUTION**  
 or **ONE DOLLAR PER POUND**



*The Good  
 Mechanic Knows!*

**\$34.50**

**Motor Speed**  
**3450 R. P. M.**  
**Weight 34-1/2 Lbs.**  
**6 Inch Wheels**

*This low price* is in keeping  
 with the recent  
 price reduction on U. S. Portable  
 Electric Drills. Get the new prices  
 on the drills. Also ask for a copy  
 of our new "Handbook of Portable  
 Electric Drill Practice."  
 It's FREE!

**The UNITED STATES  
 ELECTRICAL TOOL CO.  
 CINCINNATI, OHIO.**

District Sales Offices and Service Stations

Boston	Detroit	Philadelphia
Buffalo	Houston	Pittsburgh
Chicago	Kansas City	St. Louis
Cleveland	Minneapolis	Toledo
	New York	

Complete stocks carried in all Service Stations



Just the type of bench grinder you were thinking about getting for the garage or shop—at a price that enables it to pay for its installation in no time. A little 6 inch beauty, that will handle all those small miscellaneous grinding jobs that so frequently turn up.

Substantially constructed and of the same high quality throughout that has always been associated with U. S. Portable Electric Tools.

Being direct driven it has all the advantages and economies of portability. Ask your jobber.

*(Jobbers, write for full particulars on this new U. S. Bench Grinder.)*

**DRILLS  
 GRINDERS**



**POLISHERS  
 REAMERS**





## When You Hang This Sign Over Your Shop

—you are equipped to sell real Brake Relining service, do fast work, and make a real profit on your brake relining jobs.

To start, you have the best brake linings and clutch facings made—and you can prove it.

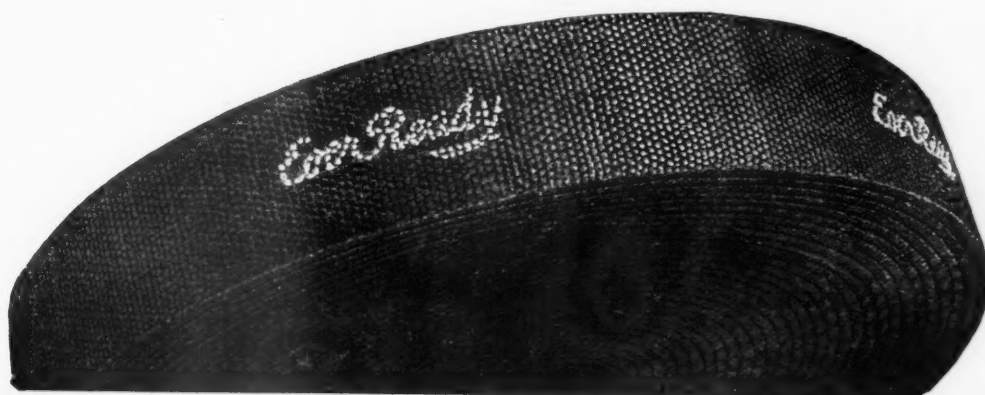
You have the best and fastest motor driven brake relining machine.

You have live dealer helps—cabinets for display, posters for your window, and a newspaper campaign that's a winner.

You can guarantee your brake linings and clutch facings for one year.

*If you, Mr. Dealer, are not satisfied with your brake relining business, if you want to make more money, write us NOW for our "Kelso Man" proposition.*

KELSO MFG. CO.  
TRENTON, NEW JERSEY



*Ever Ready*  
**CLUTCH  
FACINGS**

# Kelso

*Ever Ready*  
**BRAKE  
LININGS**

# The Great Air Mystery Explained!



Brunner Model 939  
A 2-stager



EXHIBIT A

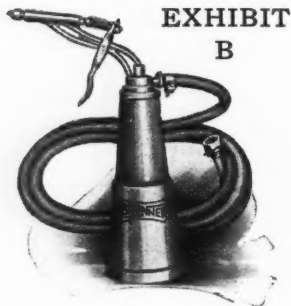


EXHIBIT B

Here are the two exhibits in the case—labelled A and B.

EXHIBIT A is the Brunner Air Compressor Leander bought. It works fast, runs quietly without vibration, costs little to maintain, is super safe and will last him for years. Leander says he has enough air from it to keep his "free air" service going besides what he uses in the shop.

EXHIBIT B is the Brunner Paint Sprayer and Cleaner Leander bought. It holds a quart of liquid, works perfectly with any liquid heavy or light, is instantly adjustable to any liquid, has trigger control, can be used in any position—even upside down. Is perfectly balanced and fits the hand.

Some folks say Leander Jones ought to be made an example of. Well—why not?

**BRUNNER MFG. CO.**

Utica, N. Y.

Oldest and Largest Builders of Garage Air Compressors in the World

Cincinnati, O. Kansas City, Mo. San Francisco  
Export Office, Utica, N. Y.

**BRUNNER**  
AIR COMPRESSORS



# INSHIELD

TRADE MARK REGISTERED U.S. PAT. OFF.

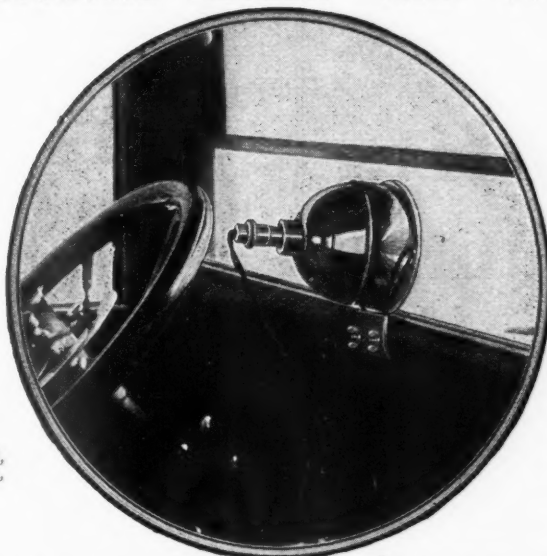
DRIVING LIGHT

The Driving Light Idea Is  
Sweeping the Country—  
*Inshields Lead the Way*

INSHIELD  
SENIOR  
\$10.00

Black or Nickel Finish.  
5½ in. in diameter. A  
Beautiful Big Light.

Patented Nov. 8,  
1921; Oct. 30,  
1923.



INSHIELD  
"8"  
\$7.50

Black or Nickel Finish.  
4½ in. in diameter. Fits  
all cars—The Universal  
Light.

We will vigorously  
protect our  
Patent Rights.

Everywhere motorists are recognizing the specialized driving light as the one indispensable factor in safe night driving. The Inshield Driving Light squarely meets this urgent need. Easily attached—no glass cutting necessary, entire light inside the windshield, powerful, durable — these are reasons why the Inshields have the call.

*"Let the Inshield Be Your Guide"*

Made only by

THE INSHIELD PRODUCTS COMPANY,

Dept. 8,

TOLEDO, OHIO





**\$1.50**

With the exception of size No. 12, which sells for \$1.75.

## Easy Profits At The Pump!

When they stop for gas, make a double profit at the pump, show them this Welco "Neva-Lost" Gas Tank Cap, that sells for \$1.50. Show them how it opens and closes with a quarter turn of the bar handle. How the spring lock and ground cork gasket holds the lid tight. Compare this clean nickel plated "Neva-Lost" cap with the rusty, dirty, hard fitting, easy loosing cap on their car. You'll make lots of sales. An assortment of 15 caps cover 70 different cars.

Free colored display stand and individual cartons.

Let your jobber start you off with a trial order.



**\$1.50**

Ford owners are looking for a good foot accelerator at a low price. Your opportunity to get their business with this Welco Accelerator. Our counter demonstrating board sells them.

## Easy to Install a Welco Foot Accelerator

You don't lose your profits on service. Only one hole to drill. Directions for easy installation on each carton. The Welco is adjustable to any idling speed. Full nickel-plate. Foot rest included. Your jobber can supply you.

TRADE MARK  
**Welker-Hoops Mfg. Co.**  
Middletown, Ct.



*Las-Stik farm paper advertising covers these states.*

## DEALERS: 80%

of the farmer car owners use tube patch when they can get it, according to the assertion of hundreds of farmers who were personally interviewed.

The largest patch advertising campaign ever run in farm papers is right now appearing in eleven publications with a combined circulation of 4,000,000.

ANY dealer who will DISPLAY Las-Stik can sell it in quantity. It is the fastest selling tube patch, with sales increasing every year.

**Las-Stik Patch Mfg. Co.**  
HAMILTON OHIO



## TAKE—

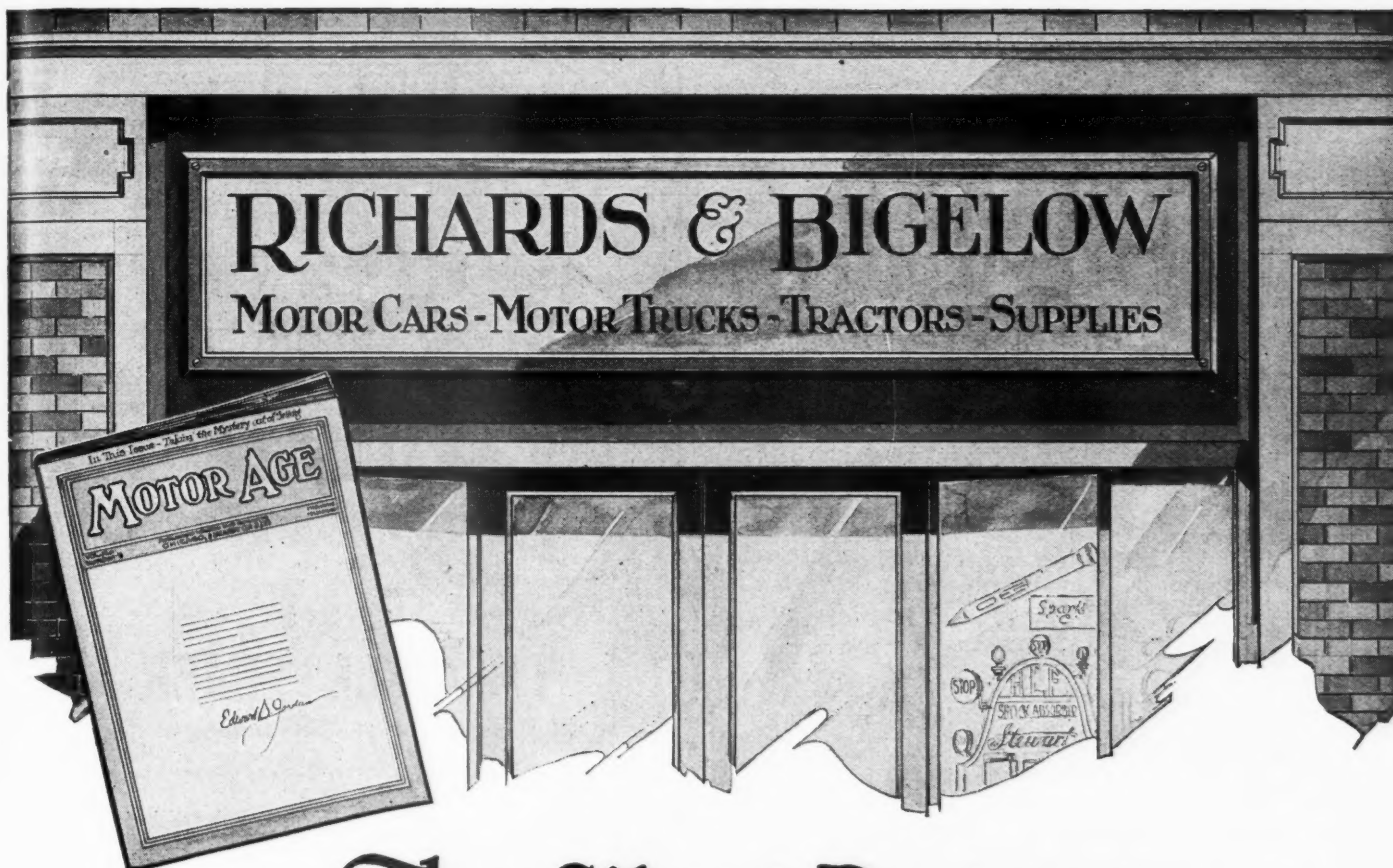
Las-Stik Tube Patch for emergencies. Adheres instantly without heat. Can't come off.

Elastic—stretches with inflated tube. Can't creep or tear out. Trade-marked white sheets 50c and \$1.00 sizes.

**Las-Stik Patch Mfg. Co.**  
Hamilton, Ohio

**Las-Stik**  
TUBE PATCH





## —The Silent Partner

To thousands of progressive automotive merchants MOTOR AGE is a source of sound advice and helpful suggestions. To these men it holds much the same position as a silent partner. It gives wise and varied counsel. It cites the experiences of other men. It warns of "get-rich-quick" methods, yet advises sweeping away the cobwebs.

In short, MOTOR AGE brings to an army of readers the kind of information that only a leading business paper can gather together. The sincere, unbiased manner of presenting this information has won for this paper a healthy, whole-hearted respect from men who are shaping the destiny of the automotive trade.

Those who read MOTOR AGE are progressive, thinking men. Those who advertise in it are in good company.

# MOTOR AGE

5 So. Wabash Ave., Chicago, Ill.



VICTOR  
No. 25

## Four Lamps in One

The "Sentinel" No. 25 fills the need for several pieces of lighting equipment at the cost of one. It is a combination PARKING, TRAFFIC, COURTESY, WARNING Lamp.

The "Sentinel" provides double safety. It flashes a red warning hand to the rear and a white "courtesy" hand to the front. It makes the driver's hand signals visible at night and defines the side of the car to the approaching motorist. These features are controlled by the Victor "Dependable" stop lamp switch which operates the major filament of the bulb.

Does not command to stop but gives a Friendly Warning—a courtesy to the approaching driver.

The "Sentinel" is a most efficient parking lamp. A dashboard switch lights the minor filament which gives a full but economical light. In emergencies, it may be used as a tail light. It is made of rust-proof material and is nickel plated. Furnished complete with cable and switches ready to install.

## The Victor Warning Hand

THE CINCINNATI VICTOR COMPANY  
714 Reading Road  
Cincinnati, Ohio



*They  
Sell*

## The BELL TIMER

"Built like a High-Grade Distributor"

Bell Timers are "Best sellers."

They don't stay on dealers' shelves—but they do stay on users' Fords.

There are plenty of reasons for Bell's steadily growing popularity. Bell needs no oiling or attention. Bell has a clean wipe contact; a solid copper brush; solid copper contacts molded into a one-piece Bakelite shell.

Nothing short of a big car's distributor can approach it for smoothness and accuracy.

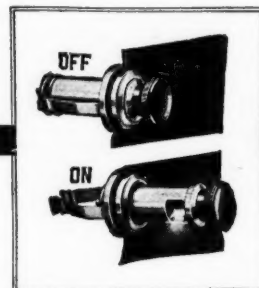
*It pays to sell Bell Timers.  
Leading jobbers carry them.*

**BELL MANUFACTURING CO.**  
13 Elkins St. Boston 27, Mass.

Makers of the new  
**BELL DASH LAMP**

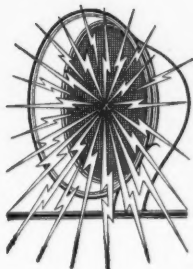
for Fords and other cars. An automatic lamp that is out of the way when not in use.

*Ask your jobber*





# You can sell or exchange that slow-moving stock



Accessories, parts, equipment for which you have no local demand may be just what someone in another part of the country needs—and will buy. The other fellow may have something you want and the exchange can be made without a cash outlay.

Exchange what you can't sell for what you *can* sell. You will increase your profits. You will eliminate all possibilities of a morgue in your store or warehouse. You will have increased capital as well as space for those things which you can sell.

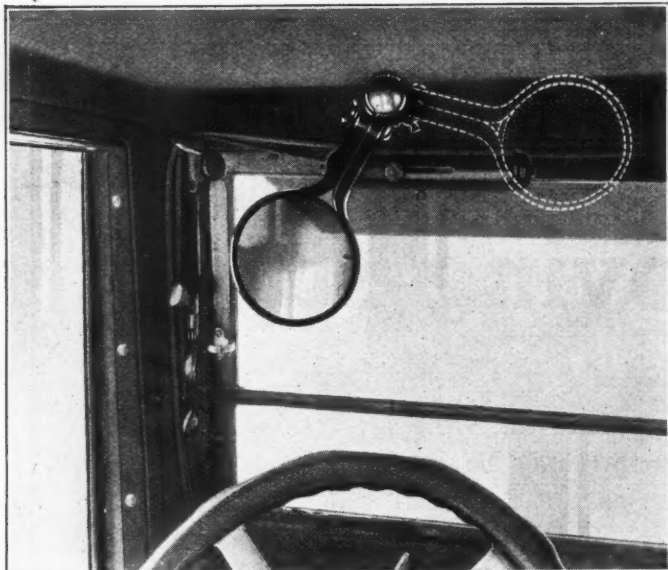
The more than 80,000 readers of Motor Age, Motor World and Automobile Trade Journal are the progressive, prosperous dealers and garagemen of this country. Your advertisement in any or all of these papers will reach the worth-while men in this business. It will span the distance between you and your prospects, however far away.

For 6c a word in the Broadcaster Department, you can tell your sales story to the readers of Motor Age or Motor World. For 10c a word you can reach the 40,000 readers of the big monthly Automobile Trade Journal.

## *The* Broadcaster

A DEPARTMENT THAT  
WILL FIND WHAT YOU WANT

For Broadcaster rates in Motor Age, Motor World, Automotive Industries, Automobile Trade Journal, Distribution & Warehousing, address the Class Journal Company, 5 So. Wabash Ave., Chicago, Ill., or 239 W. 39th St., New York.



## Convenience — Safety

### *Every Driver a Prospect*

Until now there has been nothing effective and practical to thwart the oncoming stream of glaring headlights. Now you have it—clear vision, safety, driving comfort, freedom from nerve strain. At the same time the Night-Hawk is a perfect rear-view mirror. It has an irresistible sales appeal.



It is a transparent mirror. You do not look through it continuously, but keep it between the glaring headlights and your eyes, and drive as always by looking through the windshield to the right of it. You then see the road perfectly.

### A Perfect Rear View Mirror

The Night-Hawk Glare Shield and Rear View Mirror can be instantly adjusted to any position, giving you a clear view of the rear. It is vibration proof. Styles for open or closed cars; easily attached. Manufactured by an experienced, reliable company.

*Your trade is waiting for the Night Hawk. A postal will get full information and name of a jobber near you.*



**Manufacturing Co.**

760 So. Pierce Street  
Milwaukee, Wisconsin

Manufacturers of the famous GEMCO Bumpers

## *Willys-Overland, Inc.*

*Denver, Colo.*

Gentlemen:

Acknowledging your letter asking us to run our ad for additional weeks, it will not be necessary as we have now received so many replies from the first insertion, we have been able to take care of the enlarged organization we planned in a very satisfactory way.

There is no doubt at all that your Ads do reach the right people and should we have occasion to still further enlarge our organization, we will let you run another ad for us.

WILLYS-OVERLAND, INC.  
FRED S. ANDREWS  
Branch Manager.

### TERRITORY ORGANIZERS WANTED

Have openings in our field organization for territory development men preferably with retail experience on Overland, Ford, Chevrolet or Dodge cars. Wire or write giving age, earning capacity, merchandising experience during the last five years. State whether married or single.

BRANCH MANAGER,  
Willys-Overland, Inc. Denver, Colo.

## *“many replies”*

### *to this ad*

And three weeks after above letter was written the company said: “We are still receiving replies, which is proof that your advertisements certainly do reach the man who is looking for a job.”

Broadcaster Service covers all your business wants. Whether it's finding help or employment, agents or agencies, salesmen or accounts, buyers or sellers of used machinery, equipment or surplus bargain stocks, a Broadcaster ad will give you contact with your best prospects.

Broadcaster ads are inexpensive. The ad shown above cost but \$4.50. Undisplayed ads, 6c a word.

## *The Broadcaster*

### A DEPARTMENT THAT WILL FIND WHAT YOU WANT





The Federal Authorized Sales Agency Sign—nationally advertised for years—is the public's identification of every Federal dealer.



## This Sign Will Make You More Money and More Friends

When you sell Federals you not only sell tires that will perform the kind of service you can be proud of, but you make profits that fully repay you for your efforts. And remember you make these profits on one of the old, well advertised first quality tires.

In the Federal Blue Pennant Cord you have a fine quality tire which your customers, who want the best, will appreciate. In the Blue Pennant Truck Cord you have a tire that will successfully stand any test the truck owner may make.

Federal Defender Cords and Fabrics will more than satisfy your customers who want good quality and good service but at a lower first cost.

*It will pay any dealer to learn the definite advantages the Federal Authorized Sales Agency Plan offers him.*

For compulsory bells and imperative buzzers

**Columbia Dry Batteries**  
—they last longer—

- gas engine ignition
- telephone and telegraph
- doorbells
- buzzers
- motor boat ignition
- heat regulators
- tractor ignition
- starting Fords
- ringing burglar alarms
- protecting bank vaults
- electric clocks
- calling Pullman porters
- firing blasts
- lighting tents and outbuildings
- running toys
- radio A

Bells and buzzers ring out instantly when Columbia are back of the button. No modest enticement, these. Bells just follow the news when the Columbia's power goes rapping through the wires. To give bells and buzzers lightning speed use Columbia Dry Batteries.

The more of these good batteries you connect, the louder the sound. Hook up as many as you need to make the noise you want. Columbias are always at home, eager to speed a welcome to your guests. Between calls they restore their energy—these batteries know how to rest as well as work.

Don't just ask for "a dry cell." Ask for Columbia Dry Batteries by name and get 100% battery efficiency. Columbia Dry Batteries are sold by electrical hardware and supply stores, variety shops, marine supply dealers, implement dealers, garages and general stores. Columbia Ignition can be purchased equipped with Eubank's Spring Clip Binding from all car stores.

Manufactured and guaranteed by  
NATIONAL CARBON COMPANY, INC., NEW YORK—SAN FRANCISCO

## Prospects in Every Home

Count the homes in your locality—that's the number of prospects you have for Columbia Dry Batteries. Practically every home has a doorbell, a heat regulator, a radio set—and in numerous instances a gas engine or tractor is operated on the place. Many Dry Batteries in your neighborhood need replacement now. This is the time of year to go after this business. Put Columbia Dry Batteries in your window. Suggest replacements to your customers. Order from your jobber.

*Manufactured and guaranteed by*

**NATIONAL CARBON COMPANY, Inc.**

New York—San Francisco

Canadian National Carbon Co., Limited, Toronto, Ontario



## Dealers prefer Johnson Bushings

Dealers who demand standard quality prefer Johnson Bushings for three important reasons:

1. You seldom have to ream 'em.
2. They are packed in substantial boxes and clearly labeled with the number per car or motor.
3. They are factory equipment on many of the finest motor cars and trucks.

Ask your jobber's salesman or write for price list on Piston Pin, Spring Shackle or other standard Bushings.

**JOHNSON BRONZE CO.**  
New Castle, Pa.

## As Solomon Remarked

"WISDOM is the principal thing, therefore get wisdom, but with all thy wisdom get understanding." We all can't have wisdom but at least we can have an understanding. Dealers, that's just what we're after—an understanding. Let's come to one for there's profit for you in the

## ARROW GRIP JACK

An Arrow Grip Jack sale means a lifetime of service and a satisfied customer. No more stooping or pumping. Easily placed in position and adjusted by long extension handle. Folds compactly in small space. Two sizes fit any car or truck. Stock and sell the jack that's a lift to dealer and motorist alike.



Ask Your Jobber or Write for Literature

**ARROW GRIP MFG. Co. Inc.**  
106-126 Cooper Street, Glens Falls, N. Y.  
Export Offices: 280 Broadway, New York

ACCLAIMED  
THE **KING** OF  
BATTERY TESTERS

OVER  
3,000,000  
LOYAL  
USERS

**"Break-not"**  
BATTERY TESTER

IT IS POPULAR  
because  
IT HAS REAL MERITS

ARE YOU supplying  
YOUR TRADE with  
EDELMANN PRODUCTS

Price \$100 And worth it!  
East of the ROCKIES

Write for further information -  
MADE BY  
**E. EDELMANN & CO.**  
2332 LOGAN BLVD. CHICAGO ILLINOIS

## To the Employment Manager

You want a man who will make good—someone whose record, past and present, is evidence that he is ambitious, competent, efficient, progressive and up-to-the-minute.

He will naturally be a reader of his business paper, as otherwise he cannot fill all of the above requirements.

## Broadcaster Service

can help you to locate a number of good men and from those you should be able to select just the one best fitted for your needs.

Six cents a word is all it costs for an undisplayed advertisement—but if you are in need of a man that is hard to locate a larger advertisement would doubtless prove a profitable investment.

**6¢  
a word**

Use your business paper  
to get business men





## How dry I am, Nobody knows

Nobody knows is right—that's the trouble—but—every Ford and Chevrolet owner cares—that's why Tascos are going big!

Tasco Gauges tell the Ford or Chevrolet owner at a glance the exact amount of gas in the tank. Tascos are well constructed, all working parts are enclosed—installation is simply a matter of screwing in place of regular tank cap. The price is \$1.25. Just the gauge Ford and Chevrolet owners have been looking for—priced right!

Discounts are liberal—Write!

**THE AKRON-SELLE CO.**

Akron

"40 Years in Business"

Ohio



**\$1.25**

RETAIL

**TASCO  
Gas Gauges**



## A Big Help in Car Maintenance

That "An ounce of prevention is worth a pound of cure" clearly explains the necessity for the use of Key Graphite Paste.

A few ounces of this protective paste will save leaks, wear, or rust that would otherwise mean a big loss in power, or deterioration.

### Jobbers and Dealers Sell One Article That Has Many Uses

Gasket Paste  
Prevents corrosion  
AND sulphation on  
Battery terminals.  
Makes leak-proof  
hose connections.  
On Spark Plug  
threads.  
On felt washers.  
Door Squeaks.  
Manifold paint.  
Bolt threads.  
Rust prevention.  
Spring Lubricant.



We pay the postage on FREE SAMPLES

**KEY BOILER EQUIPMENT CO.**

27th and McCasland Ave., East St. Louis, Ill.

Key Boiler Equipment Co.,  
27th and McCasland Ave., East St. Louis, Ill.

Please send me without charge or obligation a sample of Key Graphite Paste.

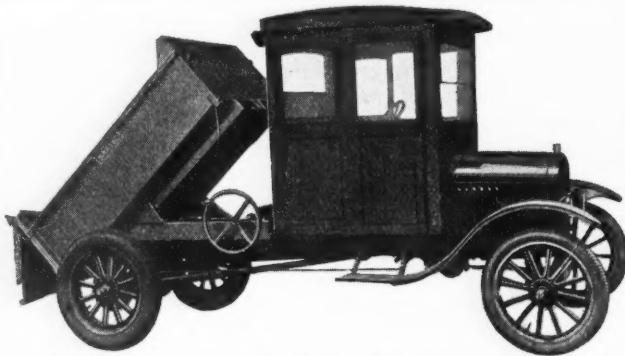
Name .....

Business .....

Address .....

Jobber's Name .....

M. A. 8-21



## More chassis sales with this body!

A good truck chassis, 2-ton or less, equipped with a Saftee Dump Body is a combination that means bigger earnings for your prospects and better profits for you!

For contracting, municipal, farm and industrial uses—the most economical, safest, dependable dumping body. BODY HELD AT ANY ANGLE WITHOUT LOCKING.

All steel construction, solidly built. Easy to operate thru worm gear mechanism. Installed in 15 minutes!

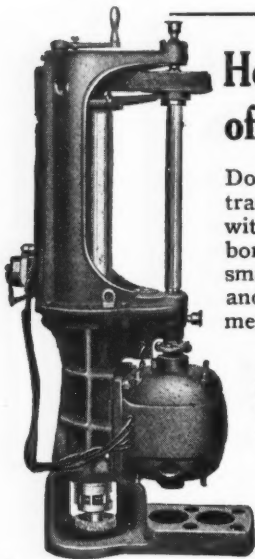
Write now for full sales data!

THE DITWILER MFG. CO., GALION, OHIO  
Also, makers of Automatic Dump Bodies

# SAFTEE

Hand Operated

# DUMP BODY



## Here Is Your Source of Real Profits

Don't worry about competition and trade-ins on car sales. Equip yourself with a Simplicity Portable Cylinder Reborer and Grinder, get big profits on a small investment, year around business and 25 per cent discount on replacement parts.

C. F. Bowen of Quick Welding & Machine Co., Kent, Ohio, says: "The Simplicity pays the largest returns of any machine in the shop."

## Simplicity

Portable Cylinder Reborer  
and Grinder

Model B with 1/2 H. P. Motor and many other improvements. Patented Mar. 6, 1915; May 11, 1920. Other patents pending.

Any mechanic can operate it, any standard electric current runs it. Handles auto, truck and tractor cylinders. Perfect work guaranteed. Free advertising and sales helps with purchase.

**EASY TERMS** allow the Simplicity to pay for itself. Write for full particulars.

**SIMPLICITY MFG. CO.**

Dept. C., Port Washington, Wis.  
Export Office, 549 W. Washington, Chicago, Ill.



Boring Head



Grinding Head

## "Koch Kreepers"

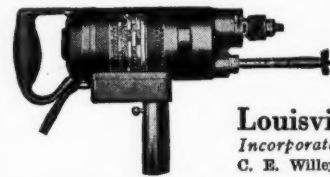
Support the head in three different positions while working under the car. Eliminate body fatigue and neck cramps. Head rest is padded and can be adjusted to any position by slight pressure of hand while worker is on creeper under the car. Sturdy and durable. Will last indefinitely. Universal steel wheel casters—ball bearing swivel. Made in three grades. No. 3—13 1/2 in. wide by 40 in. long. No. 2 same as No. 3 except head rest is not adjustable. No. 1—36 in. long and a cheaper creeper but wonderful value for the money. Fine for car owner. Write for complete details.

THE FT. RECOVERY STIRRUP CO.  
Ft. Recovery, Ohio



## Get This "Pioneer" \$65 Garage Special

Electric Drill  
and Valve Grinder



Greatest time and money saver, as well as money maker, for your shop—

"It Will Do The Work"

Louisville Electric Mfg. Co.  
Incorporated Louisville, Ky., U. S. A.  
C. E. Willey, Pres. J. B. McFerran, Secy.-Treas.

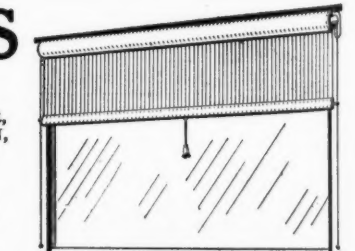
## SHADES

in stock for  
HUDSON and ESSEX  
COACHES, FORD TUDOR,  
MAXWELL CLUB SEDAN,  
and HUPMOBILE CLUB  
SEDAN

Make shades regular equipment on the car you sell. The added appearance and comfort will be a selling asset.

We make shades in colors to harmonize with the upholstery. Simply give the name, model, year of car and the exact glass measurements.

We use a fine quality of curtain silk, hemmed with two rows of stitching both sides. Shades are mounted on all-metal rollers



complete with nickel plated brackets, cord and fasteners. Also made in a washable fabric that can be cleaned with soap and water.

Write today for discounts and samples.

CHAS. W. RICE & CO.  
319 East Third St. Uhrichsville, Ohio



## MANLEY TOWING TRUCKS



Send  
for  
Catalog

heavy Malleable Steel throughout and 2" telescoping tongue. Roller Bearings are hardened, 100% road clearance. The finest perfection in a Towing Truck.

MANLEY MFG. CO.

YORK, PA.



## Every day you are losing profit

Those lifting jobs that call men away from their assignment are wasters.



One man with a Canton Crane can lift more in less time than five men without one. And there are a score of other jobs, mechanics have found, where the Canton is handy and time-saving.

Write for the booklet MA illustrated. It is a complete catalog of Canton Cranes giving sizes and prices. No obligation—just a line to—

**The Canton Foundry & Machine Co.**  
Canton, Ohio

New York Office, 203 East 15th Street

# CANTON

PORTABLE

# CRANE & HOIST

ACCURATELY  
**DALL**  
MACHINED

**SEMI-STEEL  
REPLACEMENT PISTONS**

ACCURATELY  
**DALL**  
MACHINED



For replacement work after a rebores or re-grind job insures your customer as good if not a better job than the original assembly.

Dall Pistons are simply GOOD Pistons, made to manufacturer's specifications, sometimes more refined in design and lighter in weight, but always as carefully made and inspected as though they had to pass the most rigid inspection of a Motor Manufacturer.

Dall Pistons are regularly furnished in standard and various oversizes, also semi-finished 1/16 oversize.

Write today for price list and delivery schedule on all items. Distributors at various points will take care of your requirements.

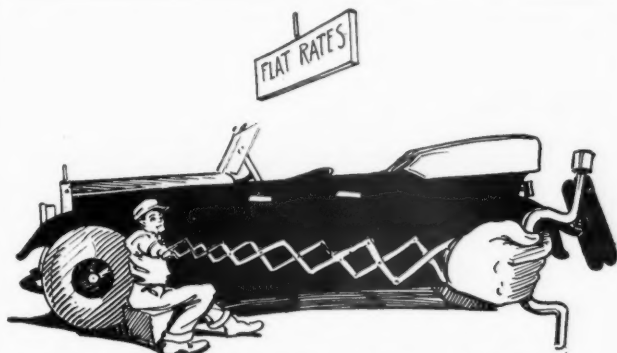
**THE DALL MOTOR PARTS COMPANY**

Post Office Station D, Cleveland, Ohio

Southwestern Branch

**THE CARROLL CO.**

2218 S. Harwood St., Dallas, Texas



## ARMS AND THE MAN

Nature failed to provide man with an "all round the shop reach".

The H & G 140 Universal Wrench Set, always at hand, saves time and money.

With his H & G Wrench Set, 140 different combinations in Tee, L and Speed Handle, long and short types, with or without Universal Joints and Ratchet, the mechanic

gets under, over or around any obstacle. No more reaching, no more running around the place for a particular size wrench.

Each socket and part of the H & G Wrench Set is heat treated and hardened and guaranteed not to break.

\$11.50 per set. Slightly higher west of the Rocky Mountains. Sold by leading jobbers.

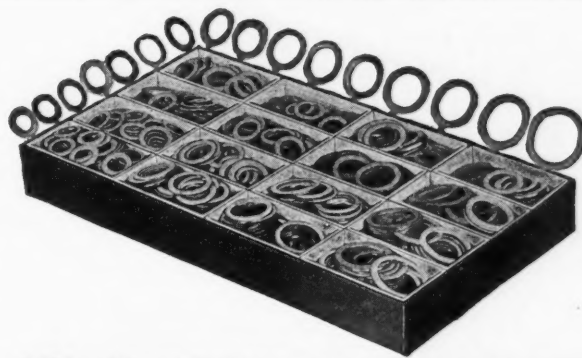


**THE EASTERN MACHINE SCREW CORP.**

10-20 Barclay St., New Haven, Conn.

In Canada: The Canadian Raybestos Co., Ltd., Peterborough, Canada.

**The H & G Universal Wrench Set**



## 850 Steel Spacing Washers

17 sizes—50 of each size per box. Inside diameters from 3/8 to 1 inch, .015 thick. This assortment made for adjusting end play in all makes and types of starting motors and generators. Largest washer illustrated made to go in the front end plate of Ford generator. Lateral motion thus adjusted without removing bearing from armature shaft.

Mailed, post paid, per box, \$3.50.

If not handled by your jobber, order from us.

Any size or sizes used, can be replaced.

**ARMATURES:** We rewind any and all kinds of GENERATOR, MOTOR and MAGNETO armatures, and reship same day old armatures received.

**FORD GENERATOR AND MOTOR ARMATURES** ..... \$ 1.50

**ALL SMALL DOUBLE UNIT GENERATOR AND MOTOR ARMATURES** ..... 5.00

**SINGLE UNIT MOTOR GENERATOR ARMATURES** ..... 10.00

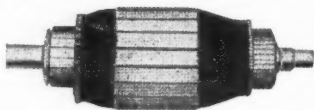
**MAGNETO ARMATURES** ..... \$3.75 to \$4.75

**Armature Rewinding Co., Inc.**

3301 Washington Blvd., St. Louis, Mo.

## SPECIALISTS In Armature Rewinding

Workmanship,  
Service and  
price *Guaranteed*.



\$1.50 for  
Ford Genera-  
tors.  
\$3.25 other  
makes.

Once a customer always a customer. Try us and be convinced.

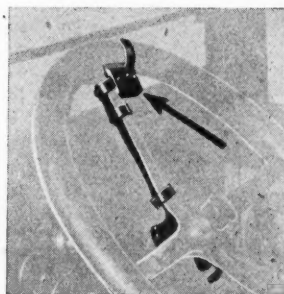
Get our complete price list. Write for it today.

**PIONEER ARMATURE CO., Inc.**

2805 Cottage Grove Ave.

Chicago, Ill.

## Controls Lights From the Wheel



A new convenience and protection for the motorist. No need to take hand from wheel and eyes from road to dim lights. INSTANDIM fits snugly to the steering spider. Easy to operate the toggle type switch. Attached in 15 minutes. Two styles: "A" for headlights, "B" for headlights and spotlight. No complicated moving parts or resistance units. Priced at \$2.25 and \$4.25. Sells at a real profit. Write.

H & H MFG. CO. OHIO  
BUCYRUS

# INSTANDIM

Light Control Systems

You get quality work, SAE specification materials, and the right price if you send your connecting rods to a Watkins plant for rebuilding and refuse imitations of



New bolts and nuts, laminated shims, new piston pin bushing are part of the rod rebuilding at no extra charge.

New Bearing tinned in the rod and broached to mirror finish fits quickly to crankshaft and cuts time on flat rate repair jobs. Practice sending your rods in regularly. There's profit in it.

## WATKINS Complete REBABBITTING SERVICE

"One Day Service from factory nearest you"

Chicago, Ill., Berguson Skinner Corporation.  
Hartford, Conn., Ripley Motor Services, Inc.  
Indianapolis, Ind., Indiana Watkins Mfg. Co.  
Kingston, Ont., Watkins Mfg. Co. of Canada, Ltd.  
Los Angeles, Calif., Wright Mfg. Co.  
Memphis, Tenn., J. B. Cook Auto Machine Co.  
Minneapolis, Minn., Wright Manufacturing Co.  
New York, N. Y., Lake Sales Company.  
Omaha, Nebr., Interstate Machinery & Supply Co.  
Portland, Ore., Factory Motor Car Co.  
St. Louis, Mo., H. & H. Machine Co.  
Seattle, Wash., Solon Grinding Co.  
Syracuse, N. Y., Watkins Mfg. Co. of New York  
Toledo, Ohio, Stewart-Burgan Co.  
Washington, D. C., R-L Motive Parts, Inc.  
Waterloo, Ia., All States Rebabbitting Service  
Wichita, Kans., Home Office, The Watkins Mfg. Co.

## Pore-Blown Plates

1. Greater capacity through our process of creating thousands of natural pores in the plate. We get this porosity without sacrificing long life.
2. All materials used in the paste are 100 per cent active. These materials are not just mixed but are thoroughly pulverized.
3. The grid is reenforced where strain is greatest. Reduces buckling.
4. We use these plates in our own batteries and place our business reputation behind them.

We handle all battery parts

Send for new catalogue

**General Storage Battery Co.**

2005 Locust St.

St. Louis

## "Better Bookkeeping at Less Cost"

A MONEY-SAVING SOLUTION  
of the

### BOOKKEEPING PROBLEM

for

GARAGE AND AUTO ACCESSORY TRADE

Write TODAY for FREE copy

THE BUSINESS METHODS CORPORATION  
617-M Security Bldg. Springfield, Mass.

## See the Broadcaster Department

Page 103

## USE A STORM HONE

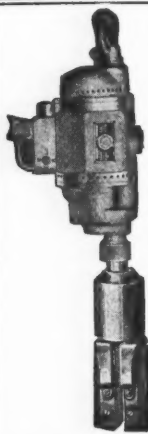
It handles an important part of your cylinder work. Takes all sizes of cylinders from 2 3/4 to 8". The deep, heavy, wide faced stones on the Storm Hone mean longer life, faster cutting and smoother finishing as well as freedom from chatter and stone breakage. Complete and with extra equipment only \$40.25.

Write for the Storm Book,  
"Modern Cylinder Methods"

# STORM Mfg. Co.

406 A Sixth Ave. So.  
Minneapolis

Minn.



One-Piece **SURE MIKE** Drop Forged  
COUNTER BALANCED CRANK SHAFT FOR FORDS



Design  
patented  
J. WADSWORTH STAFF,

643 McCormick Bldg., CHICAGO



## IT'S EASY TO SELL

"The only oil ring with a  
mileage guarantee"

"Sav-Oil" is stamped on bottom of every ring

**The Sav-Oil Ring Mfg. Co.**

1037 S. Figueroa St., Los Angeles

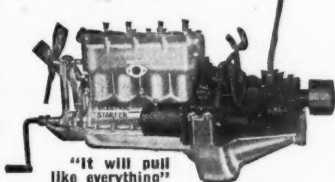


## MORE POWER Replaces the regular Ford Transmission

### SIMPLEX 3 SPEED Sliding Gear Type

For Ford Cars and Trucks

26 to 1 in low in our new type "CT"



"It will pull like everything"

Have three speeds forward and one reverse, replacing the regular Ford transmission—drums, bands and all. The low speed is lower than the Ford, therefore, more power—the third is the same as the Ford and the second is half way between. It's ruggedly built with oversize alloy steel gears. Multiple disc clutch. Foot brake on jackshaft outside of case. Hyatt Roller and Genelite bearings. No cutting or machining—installation easy.

E. D. & A. F. CRONK, Inc., 140 Hotel St., Utica, N. Y.

## Jack—For Balloon Tires



Patent Applied For

The Springfield Jack No. 9 especially designed for balloon tires—

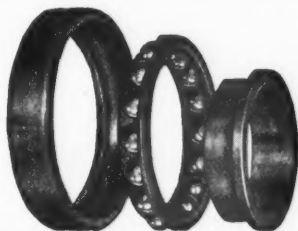
Double Screw—Ball Bearing Low Placement—High Lift Height when closed, 7 inches Extends to 17 inches.

Convenient handle excellent workmanship and quality.

Dealers—Jobbers—Write us for discounts

**THE SHAWVER CO.**  
Springfield, Ohio

Weight 8 pounds  
Capacity 1 ton  
Price \$4.75



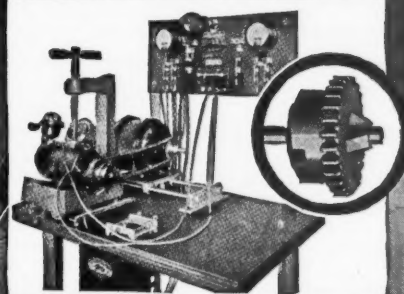
The Bearings Company of America, Lancaster, Penna. Angular Contact Thrust Bearings. Angular Contact Radial Bearings. Manufacturers of Thrust Ball Bearings of all types. Let our Engineers help to solve your Bearing problems.

**The Bearings Company of America,**  
Lancaster, Penna.

Detroit, Mich., Office,  
1012 Ford Bldg.

## EXCELSIOR TEST BENCH

With the Positive Drive and Speed Control



### INCREASE YOUR PROFITS!

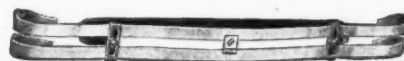
Starting, lighting and ignition pays bigger profits than any other branch of automotive service.

**The Excelsior Test Bench** equips your shop complete for this work.

**Price \$385.00**

Payable \$50 per month  
Write for bulletin 975M

**WEIDENHOFF** 4350 ROOSEVELT ROAD  
CHICAGO, ILL. U.S.A.



DUO - CONVEX—  
A popular style for all cars at \$15.00 to \$18.00

"Time-tested" is the way one dealer accounts for our unusual lifetime guarantee—which actually is a lifetime guarantee, by the way. He knows we always make it good.

NEW ERA SPRING & SPECIALTY CO., GRAND RAPIDS, MICH.

## There Simply Isn't Any Better Flux Made Than Rubyfluid!



A complete substitute for dangerous acids, Zinc Chloride, Salammoniac and other mixtures commonly used as a Flux. Ruby Fluid is quick acting, anti-rusting and is always ready for instant use. Ruby users include the foremost industries of the country.

Send for generous Free Sample

**Rubyfluid**  
TRADE MARK REG.

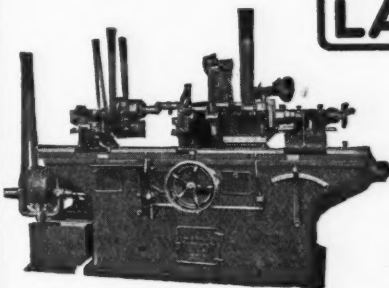
COMBINATION  
SOLDERING AND TINNING FLUX

THE RUBY CHEMICAL CO.

68-70 McDowell St.

Columbus, O.

## LANDIS

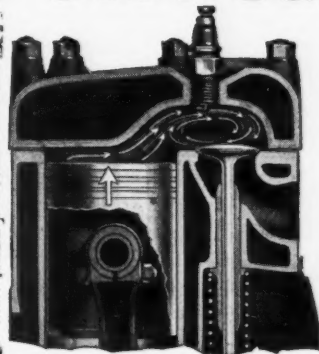


The LANDIS 4-A Special GARAGE Grinding Machine is built ESPECIALLY for repair shop work. You don't need a manufacturing machine—don't get one. The 4-A Special is perfect for repair shops. Quick and easy change from job to job. Simple to operate. ACCURATE. Built by world's largest makers of grinding machines. More value for your money. Catalog.

**Landis Tool Co., Waynesboro, Pa.**

New York Office—30 Church St.

## The Ricardo Head



A revolutionary improvement in engine construction that permits such outstanding advantages as higher compressions, greater speeds, increased power and superb motor flexibility under all speeds and loads—at an operating cost that is surprisingly low.

**WAUKESHA**

Motor Company  
ENGINE BUILDERS

Waukesha, Wisconsin  
New York, N. Y.





### PERFECT PERFORMANCE

The remarkable showing of the three Fronty-Fords in the 500 mile race was due solely to the Frontenac Cylinder Head. This head is adapted for use on YOUR Ford by its designer and builder, Arthur Chevrolet. Book, "How to Build a Fronty-Ford," \$2; free with orders of \$50 or more. Write for FREE catalog.

**CHEVROLET BROS. MFG. CO.**  
410 W. 10th St. INDIANAPOLIS, IND.

### Mosler SPIT-FIRE Timer

*Works like a clock*

New Design combines double life reversible roter and lubricated cushion felt raceway. Eliminates wear. Price, \$1.25.

**MOSLER METAL PRODUCTS CORP.** Mt. Vernon, N. Y.  
Manufacturers Mosler Superior Spark Plugs.

## FYRAC

### Night GUIDE

*the Super Spotlight*

**FITS THROUGH THE WINDSHIELD GLASS**

Fyrc Mfg. Co.  
Rockford, Ill.

## WAYNE

### CYLINDER REBORING MACHINE & VALVE GRINDER

Be equipped with these two efficient machines to render good service on cylinder reboring and valve grinding jobs. Save time and labor and get more profit.

*Write for details.*

**WAYNE TOOL MFG. CO., WAYNESBORO, PA.**



### BUTLER SPRINGS AND THE ACE OF CLUBS ALWAYS WIN

Butler Springs are made of very fine grade steel. They are carefully heat treated and tested for hardness and strength.

Order your Ace of Springs today.

**BUTLER AUTOMOTIVE SERVICE CO.**  
101 D ST. EASTON, PA.

*"It pays to buy a Kellogg"*

## KELLOGG COMPRESSORS

ROCHESTER, NEW YORK



\$5

### Wood-Imes

Water Circulating Pump  
For Ford Cars and Trucks

Is as reliable as the Ford Car itself and assures a positive cooling system that constantly functions. No more overheating—No more freezing in travel—Made engineeringly correct of best materials—quickly and easily installed. Write for Dealer Discounts and complete information.

**WOOD-IMES MFG. CO., MINNEAPOLIS, MINN.**  
Formerly Mid-West Mfg. Co.

### DO MOTOR RE-CONDITIONING AND EARN BIG MONEY!

You can ream and hone an average cylinder bloc the factory way in fifty minutes. Do the work without removing the engine, quickly, efficiently and economically. All you need is

#### FOSTER-JOHNSON Re-Conditioning Equipment

Cylinder and Piston Reamers, Hones, Kylin General Purpose Reamers and Reamer Sharpeners, all included.

Write for Foster-Johnson Station Manual and Tool Catalog

**FOSTER-JOHNSON REAMER CO.**

1310 Beardsley Avenue.

Elkhart, Ind.

## WEL-EVER

### "OIL CONTROL" PISTON RINGS

The Motor Necessity That Has Made Good

Backed by Seven Years' Satisfactory Service

**THE WEL-EVER PISTON RING CO., TOLEDO, OHIO**

Sold most everywhere. If your dealer cannot supply you write us.

For Dependable Air Use a  
Franklin Super Single Stage Air  
Compressor

Write for full particulars

**FRANKLIN  
AIR COMPRESSOR WORKS**

2604 Main St.,

Norristown, Pa.



### POWERFUL — SAFE — FAST! "DICKERSON" TURNTABLE JACK

Handles all cars for all kinds of work. Great for spring and chassis repairs. Saves time—makes money for you. Priced RIGHT. Write for catalog.

**C. A. DICKERSON  
COMPRESSOR CORP.**  
Buffalo, N. Y.



## FISK TIRES

*There's a Fisk Tire of extra value in every size,  
for car, truck or speed wagon*

### LINENDOLL EXHAUST HEATER



Attractive in appearance, with cleaning features of removable heating coil with no connecting joints inside the heater pan to leak. Meets instant approval. No odor or noise. Easily installed and operated. Will boost your winter sales—get our attractive trade proposition.

**THE NORWALK AUTO PARTS CO.**  
Norwalk, Ohio



### The 100% Lubricants

Guaranteed not to cake or harden or to contain any Moisture, Mineral or Fatty Acids. Attractive proposition for Jobbers and Dealers.

**RADIANT OIL CO., Inc.**  
Manufacturers and Compounders

Lima

Ohio

## Stevens Tools

OVER 100 ACCURATE SHORT-CUTS  
TO GOOD WILL AND PROFIT ~ ~  
"Thru your jobber - his service is economy"

**STEVENS & COMPANY**  
375 BROADWAY - NEW YORK

**"The Best-Equipped Shop  
Gets the Business"**

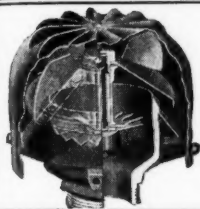


## Goodrich Cable

AUTOMOTIVE EQUIPMENT  
*Starting-Lighting-Ignition*  
Formerly M.R.

Goodrich Cable is sold in lengths found to be the most popular with the average buyer—coils of 100 ft. packed in individual cartons. Both shop men and car owners like the clean 100 ft. package idea—and this leads to quick and profitable sales. Send for samples, prices and discounts.

THE GOODRICH-LENHART MFG. CO., Hamburg, Pa.



**Make the Air Cleaner Profits in Your Community**  
**UNITED MFG. & DISTRIBUTING CO.**  
9707 Cottage Grove Ave., Chicago, Ill., U.S.A.  
Wm. E. Kemp, 245 W. 55th St., New York City  
New York and New England Distributor  
**THE UNITED AIR CLEANER**  
*Dustless Air to the Motor*

## ECLIPSE Safety SHADE

Instantly adjusted to any desired shading position with one hand from driver's seat. Makes night driving safe. One size for all cars. Write at once for our plan of distribution and full details.

**SUBURBAN TRANSIT CO., Plainfield, N. J.**  
*Subsidiary of Spicer Mfg. Co.*



## Real High Tension Ignition for Ford Cars

Varley coils eliminate nearly all chronic ignition trouble. Save gas. Add power. Keep plugs clean. Stop misfiring. Save repairs. \$2.50 each. Write for full particulars.

**The Autocoil Co., Jersey City, N. J.**



## QUALITY—PROFIT—TURNOVER

**American Hammered Piston Rings**

American Hammered Piston Ring Company  
Baltimore, Maryland

## ALMOND

### "STRAIGHT LINE" DRILL CHUCKS

When buying Portable Electric Drills be sure to look for the distinctive ALMOND CHUCK, which may be easily identified by the "STRAIGHT LINE" milling on the chuck body.

Write for complete information regarding the new ALMOND "STRAIGHT LINE" CHUCKS.

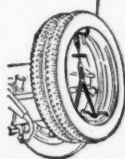
**T. R. Almond Mfg. Co., Ashburnham, Mass., U. S. A.**

## \$700 Profit in One Month

That's what one distributor made. He's only one of many doing a big business. Dealers, too, are making sales by the dozens. Few accessories in recent years have been as popular as the

**DUPLUX**  
Second Spare Tire Carrier & Rim Tool  
Carries spare tire—also expands and contracts rim when changing tires. Two tools for the price of one. Write for details.

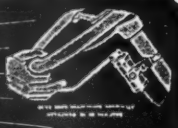
**TRIPP-SECORD & CO.**  
606 Kerr Bldg., Detroit, Mich.



## Lorentzen Headlight Kontrol

**AN AUTOMOTIVE NECESSITY THAT SELLS**

LORENTZEN HEADLIGHT KONTROL, INC.  
60 Grand St., New York City.



Now offering both the matchless Peerless Eight and the Superb Peerless Six

# PEERLESS

## Buick Continues Hall Endorsement

After using Hall Hones for over one year Buick test out the New Hall Hone and approve of it. It is the only Hone endorsed by Buick.

**THE HALL CYLINDER HONE CO.**  
435 Dorr St., Toledo, Ohio



## WIZ Flat Packet Register

American Sales Book Company, Ltd., Elmira, N. Y.  
Dept. B7284

West of the Rockies  
Pacific Manifold Book Co.,  
Emeryville, Cal.

In Canada  
P. N. Burt Company, Ltd.  
Toronto, Can.

For Any Manifold Record

Flat packet instead of several rolls. Any number of copies. Always in good alignment. One strip files away flat in a locked compartment ready for posting, reference or auditing.

## RAMCO CUSHION INNER RINGS

Fit behind piston rings and keep them in perfect contact with the cylinder walls at any motor speed or temperature.

**RAMSEY ACCESSORIES MFG. CORP., ST. LOUIS, MO.**

## We Make RADIATOR CORE EQUIPMENT

For the Complete Manufacture of RADIATOR CORES

Ask Us About This Equipment  
*We make the best radiator test plug.*

**RADIATOR ENGINEERING CO.**

626 Nesselwood Ave.

Toledo, Ohio

## YOU can handle this body PROFITABLY

**HYMAN PRESSED BODIES**  
THE HYMAN PRESSED BODY CO.,

All steel construction provides lightweight with extreme strength. Outlast chassis. One design fills most light truck user's requirements. Ton and Half-ton sizes. Shipped knocked down. Low priced. Distributor and dealer terms liberal. Write.

Huntington, W. Va.

## GREEN HIGH SPEED CAMSHAFTS

Replacement for FORDS and other cars. Higher speeds and more power possible. Gasoline saving. QUALITY at a LOW PRICE. Write for big discounts.

**Green Engineering Co., Dayton, Ohio**

## Biflex Cushion Bumper

for every car



"PROTECTION WITH DISTINCTION"

**THE BIFLEX CORPORATION, Waukegan, Ill.**



## Meachem Gear Rings for Fly Wheels

Quality rings at  
lowest prices. Get  
our list.

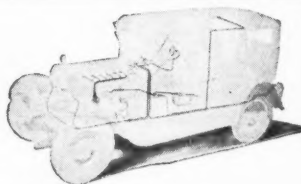
MEACHEM GEAR  
CORPORATION  
Syracuse, N. Y.

## Yes! Outperforms any car in its class GARDNER

BUILT BY THE GARDNER MOTOR CO.—BUILDERS OF VEHICLES SINCE 1882

**Packard  
Cable**

The Packard Electric Co.  
Warren, Ohio



## TESTBESTOS Automobile Brake Lining

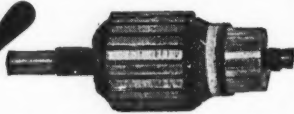
Manufactured by  
AMERICAN ASBESTOS COMPANY  
Norristown, Pa., U. S. A.

## Battery Plates

CONTINENTAL BATTERY CO.,  
3201 Papin St., St. Louis, Mo.

## REPAIRMEN

Here's a new  
source of profit!  
Send us your rewind jobs. We  
are "Armature Winding Spe-  
cialists."  
Profit for you in our service. Ford generator armature rewind—\$1.95. Other  
prices in proportion. All work guaranteed. Write for catalog and prices on  
all generators.  
H. M. FREDERICKS CO., Lock Haven, Pa., U. S. A.



Curtis Pneumatic  
Machinery Co.

1527 Kienlen Ave.  
St. Louis, Mo.



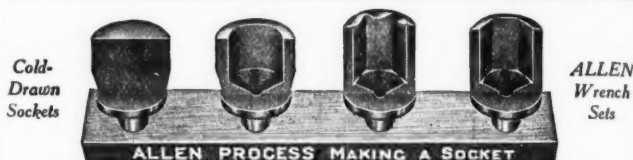
**"In Stock -  
Not Over a Day Away"**  
Write Milwaukee Die Casting Co., Mil-  
waukee, Wis., for name of one of our 500  
distributors nearest you.

MILWAUKEE BEARINGS

## Johns-Manville ASBESTOS BRAKE LINING

## ZENITH More CARBURETOR Power Less Fuel

Zenith - Detroit Corporation, Detroit, Mich.



The Allen Manufacturing Company, Hartford, Conn.

## UNIVERSAL HOSE CLAMP

Adjustable. Two sizes will clamp any hose of  
any diameter. Made from cold rolled steel out  
of wire. No rough edges to cut hose. Put on  
in less than a minute. Everlastingly leak-proof.  
Order Universal Hose Clamps. Trademark on  
every clamp and carton. Get them from your  
jobber—or write us.

UNIVERSAL INDUSTRIAL CORP.

Hackensack, N. J.

## NEVER-LEAK

### CYLINDER HEAD GASKETS

Heat-proof Gas-proof Can't blow out Retain their life  
Oil-proof Water-proof Last longer Keep customers sold  
One for every standard make of car, truck and tractor.

The Fitzgerald Mfg. Co., Torrington, Conn.

*Mac's  
Gaslevator*

## A Vacuum Gas Feed and Emergency Reserve Combined

For Ford Cars and Trucks  
Mountain Accessory Co.  
Emporium, Penna.

\$7.50



## Noiseless Timing Gears

Install quietness — Cloyes NOISELESS  
Timing Gears. They give the motor a  
soft, even "purr"—permanently.

Cloyes Gear Works  
1614 Collamer Ave., Cleveland, O.  
Sales Representatives  
United Autoware Co., Fisk Bldg., New York City  
N. Lowenthal, Box 952, Ft. Worth, Texas

**Pedrick**  
HEAT-SHAPED  
PISTON RINGS

Heat shaped to in-  
sure perfect round-  
ness, sold at almost  
the price of a snap  
ring.

Wilkening Mfg.  
Company  
15th and Mt. Ver-  
non St., Philadel-  
phia, Pa.

**EVER HOLD PRODUCTS**

Automatic Hose Clamps  
Sectional Tool Racks  
Soderless Connectors

**VITEK MANUFACTURING COMPANY**  
Industrial Building, Omaha, Nebr.



**CASE**  
**MOTOR CARS**

**J. I. CASE T. M. COMPANY**  
Racine Wisconsin



→ **"CONNEAUT"** ←  
**Plastic Metallic Packing**

Patented

Stops the leaks in automobile water pumps. Mold it with your fingers. Makes a smooth metal bearing—adjustable and practically frictionless. At your Jobbers—Get it today. It does the trick. Put up in 1 lb. cans. If your Jobber doesn't carry it, write us direct. Price \$1.65 per pound, f. o. b. Conneaut, Ohio.

The Conneaut Packing Company

Conneaut, Ohio

**The MINUTE METER \$2.50**

Greatest clock value ever offered the trade. Accurate—handsome. Protected against vibration. Regulated without dismantling dash. Great seller. Price in Canada \$3.50.

The LEX CLOCK MANUFACTURING CO., INC.  
Waterbury - Connecticut - U.S.A.



CRANK PIN  
RE-TURNING  
TOOL



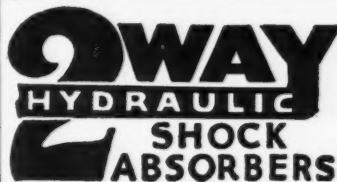
The Auto Hone Co., Buffalo, N. Y.

**\$2.00**  
Retail

**Life Timer**  
for Fords

Needs no oil. Short proof. Fool proof. Wipes a perfect contact regardless of wobble in the shaft. Bakelite Commutator is reversible, giving 2 timers for the price of one. Sold through the jobber. Write for folder and discounts.

**Mechanical Production Co.**  
MILWAUKEE, WIS., U. S. A.



Controls the springs both ways—up or down. The greater the shock—the greater the hydraulic force—a smooth, even force that absorbs all shocks. The 2-Way gives great and lasting satisfaction. Owners are Boosters. Our franchise will make you money. Write for particulars.

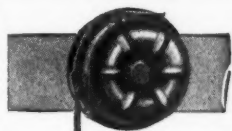
**AUTO SPRING CONTROL CO.**  
Jamestown, N. Y.

**Jacobs ROAD-LITE**

Lights the way to safety

Lights up the right hand side of road 60 to 70 feet ahead. Can't shine in other fellow's eyes. Invaluable for night driving.

Jacobs Auto Safety Lamp Co., Blacksburg, Va.



**BURD**  
**GILMAN**  
**SHOCK ABSORBER**

The Perfect Snubbing Device with the Steel Cable  
Distributors Everywhere  
Burd High Compression Ring Co., Rockford, Ill.

**Chaneeze**

The New Design  
helps it to Sell



Chain Tightener

The improved design of the Chaneeze Anti-Skid Chain Tightener, besides tightening chain, preventing slap and rattle—helps the chain to creep, thereby saving wear on tires to a noticeable extent and providing a strong sales feature. Retail price \$1.00 pair. Individually boxed, liberally discounted. Jobbers—Dealers—Write.

**ELECTRIC PARTS CORP.**  
318 E. Genesee St. Syracuse, N. Y.



**USE THE AMMCO**

Cylinder Re-Conditioning Tool  
Regrinds and refinishes cylinder bores. It is self-adjusting, self-aligning and self-centering. Write for Bulletin.

**Automotive Maintenance Machinery Company**  
551 W. Washington St. Chicago

**MONOGRAM**  
**ORIGINAL**  
**SELF LOCKING RADIATOR CAP**

GENERAL AUTOMOTIVE CORP., 600 W. Jackson Blvd., CHICAGO

**ROSE TIRE PUMP**

Is carried by more dealers than any other tire pump. The patent valve makes pumping easy.  
**FRANK ROSE MFG. CO., HASTINGS, NEBR.**



**WATSON**  
**STABILIZERS**

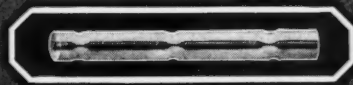
**Jthey work**

**JOHN WARREN WATSON CO.**  
Phila.: 24th & Locust Streets  
Detroit: 51-53 Canfield Ave., E.

*Thirty-seven*  
**BRANCHES**  
**AHLBERG BEARING COMPANY**  
321 EAST TWENTY NINTH STREET, CHICAGO ILLINOIS

**KESTER Acid-Core WIRE SOLDER**

"REQUIRES  
ONLY  
HEAT"



SAMPLE  
FREE

**CHICAGO SOLDER CO.** 4201 Wrightwood Ave.



# Kawneer

SOLID COPPER  
STORE FRONTS

Write for Special Book Garage Fronts  
THE KAWNEER CO., 1219 Front St., Niles, Mich.

## THE QUINCY SILENT AIR-MASTER

The Most Air Per Dollar Cost

WALL PUMP & COMPRESSOR CO.

Quincy, Ill., U. S. A.

## NO-LEAK-O PISTON RINGS



Won't Leak Because They're Sealed With Oil

No-Leak-O Piston Rings are making money for dealers everywhere. Their "oilSEALing" groove—found only in No-Leak-O—picks an oil film in between piston and cylinder walls like "packing" in a pump. Oil and gas stay where they belong. National advertising is helping the dealer sell No-Leak-O.

It will pay you to stock No-Leak-O at once.

Price 35c and up

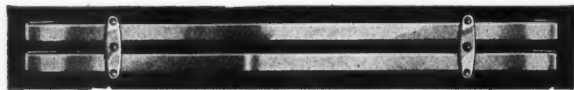
NO-LEAK-O PISTON RING CO., Dept. 376, Muskegon, Mich.



## The "Big Four"

A complete car washing service.  
RUBBER COVERED—IMPOSSIBLE TO INJURE CAR.  
Used in connection with our Little Giant Water Savers, or can be applied to any 1/2 in. or 3/4 in. valve.  
Rubber Nozzle—for full water flow.  
Spray Nozzle—for general purposes.  
Spout Nozzle—for cutting mud from fenders, etc.  
Slot Nozzle—a sheet of water covering a large surface with force.

PRICE—Set of four Nozzles, \$2.00 less dealers discount  
The Gaylord Manufacturing Company  
Paterson, N. J.



Spring-steel, Oil-tempered Bumpers in Six Complete Styles. Guaranteed Satisfactory Attaching Arms for all Leading Makes of Cars.

We invite comparison in appearance, quality and price.

THE BELLEVUE MANUFACTURING CO., Bellevue, Ohio

Over 110,000,000

## TIMKEN

Tapered  
ROLLER BEARINGS

Have Been Manufactured

## JOHNSON Gas Appliances

Metal-Melting Soldering Heat-Treating  
JOHNSON GAS APPLIANCE CO.  
Cedar Rapids IOWA

Pacific Coast Repr., C. B. Babcock Co., San Francisco, Calif.  
New York Office—277 Lafayette St.

## LINCOLN

FOR ALL CARS—\$15 to \$36  
SHOCK ABSORBERS

## ONE DAY BATTERY CHARGING—THIS YEARS BIGGEST MONEY MAKER



Only \$35 cash brings you complete HB 8 hour battery charging outfit. Easy monthly terms; let your profits pay balance with nice surplus besides. 30 days' free trial on money-back, guarantee. Start now to make big profits. More HB's in use than any other make. Write today for information. Hobart Bros. Co., Box AR 11, Troy, Ohio.

ONLY \$35 COMPLETELY EQUIPS YOUR SHOP FOR HB ONE-DAY BATTERY CHARGING SERVICE



## KING QUALITY

ALL THE NAME IMPLIES

STEERING KNUCKLE BOLTS AND BUSHINGS  
PISTON PINS—PISTON PIN SET SCREWS  
KING MANUFACTURING CORPORATION  
BUFFALO, N. Y.

FORD DEALERS! Ask your customers this—"Which would you prefer—a *Stewart* speedometer on your instrument-board or a 'speed cop' on your running-board?"

## BATTERY SERVICE EQUIPMENT!

UNITRON | PORTOSTAT  
Rectifier | Test Set

FOREST ELECTRIC COMPANY

New and Wilsey Streets

NEWARK, N. J.

Let us send you our FREE Catalogue on

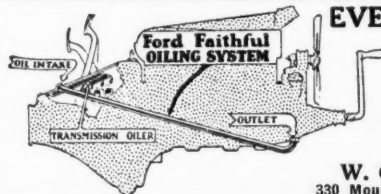
## Huetter's

Fly-Wheel Gear Bands

Huetter Machine & Tool Co.

546 Kentucky Ave.

Indianapolis, Ind.



## EVERY FORD SHOULD HAVE THIS

Positive lubrication for transmission. Sells on sight Display it and ring up the profits. Retail \$5.75. Many dealers making big clean-up. Write for details.

W. O. Thompson Mfg. Co.  
330 Mountain View St. Pasadena, Cal.

## TAKE THE END-PLAY OUT!

—WITHOUT PULLING THE MOTOR



THE C. A. ADJUSTABLE CENTER BEARING CAP corrects Ford crankshaft end play and sets magnetos for highest efficiency without removing the motor. Easily and quickly installed. Guaranteed for one year. List price \$3.75. Ask your jobber or dealer or write us direct.

Pat'd 7-22-'22

ADJUSTABLE BEARING CO., Inc.  
Dept. M. Brazil, Indiana

## PARAFLECTOR

At last—a headlight reflector that makes night driving safe. Write for full details.

The PARAFLECTOR CO., Minneapolis

# The Broadcaster

A Department that will Find What You Want

## PARTS and REPAIRS

## HOUSE OF A MILLION AUTO PARTS

THE LARGEST STOCK OF NEW AND USED CAR AND TRUCK PARTS IN THE WORLD. WE HAVE EVERYTHING.

New and Used Motors, Gears, Axles, Bearings, Springs, Magneto's, Generators, Clutches, Starters, Universal Joints, Radiators, Cushions, Wheels (Wood, Disk, Wire,) Carburetors, Piston Rings and Pins, etc.

Always mention model and serial number in order.

Write us. All inquiries answered promptly

DOUGLAS AUTO PARTS CO., INC.  
2003-5-7-9 South State St. Chicago, Ill.

## AUTO Save 50 — 90% 2000 Models PARTS

NEW AND USED GEARS, AXLES, BEARINGS, SPRINGS, MAGNETOS, GENERATORS, ETC. JOBBERS IN BANKRUPT AUTO SUPPLIES.

BRIGHTMAN AUTO EXCHANGE  
321 Windsor Ave. HARTFORD, CONN.

## DOWMETAL PISTONS

Lighter, stronger, and longer wearing than aluminum or iron. Can be fitted with bronze bushings in the wrist pin holes same as in iron pistons. Dowmetal has no permanent growth. The expansion is little more than iron.

SEND FOR PARTICULARS  
LAMMERT & MANN CO.  
Cylinder and Crankshaft Grinding  
215-21 N. Wood St. CHICAGO Phone West 4918

## JANSEN FLY WHEEL GEAR RINGS

Chevrolet 490.....\$3.00  
Chalmers ..... 4.00

JANSEN MACHINE COMPANY  
Des Moines, Iowa

ANY PART *Send for Catalogue*  
for **Cincinnati Auto Parts**  
NEW **& Wrecking Co.**  
or **712-714 Walnut St.**  
USED **CINCINNATI, OHIO**  
Parts our middle name

## AUTO PARTS

SAVES 50% TO 75% ON ALL CARS

New and Used Gears—Springs and Axles—Cylinders—Motors—Rear Systems, etc. Wire or Write

INDIANA AUTO PARTS CO.  
318-18 NO. ILLINOIS ST. INDIANAPOLIS, IND.  
LARGEST CAR WRECKERS IN INDIANA

## INFORMATION

**Six cents a word** is the rate for all undisplayed advertisements set solid, regular want ad style; all capitals, 9c. a word; all capitals leaded, 12c. a word; minimum charge \$1 an insertion; payable in advance (see next paragraph).

**Ten per cent discount** if one payment is made in advance for four or more consecutive insertions. Advertisements other than "Positions Wanted" will be billed monthly if run more than four times.

**Add five words** for address if replies are to come to a box number address at any of our offices. These replies are forwarded each day as received, in new envelopes, at no extra charge.

**Refund will be made** if all insertions ordered are not needed, the amount refunded being the difference between cost of insertions given and full amount paid.

**Telephone orders** must be confirmed in writing same day. No allowances can be made for errors of any kind unless prompt notification is sent us.

**When replying** to blind ads be careful to put on your envelope the correct box number and do not enclose original letters of recommendation—send copies.

**Displayed advertisements** are sold by the inch. Rates will be furnished upon application.

**The right is reserved** to refuse any advertisement and also to rewrite and edit copy furnished whenever the publishers consider it advisable to do this.

## THE BROADCASTER DEPARTMENT

## THE CLASS JOURNAL COMPANY

239 W. 39th St., New York  
5 S. Wabash Ave., Chicago

## PARTS and REPAIRS

## PARTS FOR AUTOS AND TRUCKS

WHAT DO YOU NEED? We have it. Gray's Auto Parts Company, 3212 Brighton Road, Pittsburgh, Pa.

## PATENTS and PATENT ATTORNEYS

Attorney-at-Law and Solicitor of Patents  
**C. L. PARKER**  
Formerly Member Examining Corps, United States Patent Office  
American and foreign Patents secured. Searches made to determine patentability and validity. Patent suits conducted. Pamphlet of instruction sent upon request.  
McGill Building, WASHINGTON, D. C.

## PATENTS

BOOKLET FREE HIGHEST REFERENCES  
PROMPTNESS ASSURED BEST RESULTS  
Send drawing or model for examination and report as to patentability  
**WATSON E. COLEMAN, Patent Lawyer**  
644 G. Street, N. W., Washington, D. C.

## MISCELLANEOUS

## "WILL TRADE OR SELL"

Prosperous automobile accessories and tire business located in one of the most progressive cities in Northern California. I want to go East. You may want to come West. Let's trade. Business is worth about \$40,000 and it's growing fast. What have you to trade? Address Box 6169, c/o Motor Age, 5 S. Wabash ave., Chicago, Ill.

**225 NEW 4-CYLINDER VALVE-IN-HEAD ENGINES**  
Carefully protected in storage and in absolutely new condition. S. A. E. rating, 19.60 h.p. Made for the last model "Saxon." Will be sold in small lots but very attractive prices will be quoted to move the entire lot. Standard Rail & Steel Company, Madison, Illinois.

**ROADSTER BODIES, HUDSON SUPER-SIX.** We have two aluminum bodies made by Noma Motor Corporation, New York, upholstered in blue leather with cushions and windshield frame. A low snappy roadster body for any Hudson Chassis. Price \$250.00 crated f. o. b. Gentry Motor Company, Enid, Oklahoma.

**FOR SALE** or to let on royalty, U. S. Patent on Magnetic Controller Vacuum Tank. No more flooded motors on account of broken springs or punctured floats. Thoroughly tested and a perfect worker. Will make a great replacement accessory. A. F. Boylan, L. B. 68, Denison, Iowa.

**10,000 AUTOMOBILE BEARINGS**, 60c for quick sale (List price \$4.25) in original factory packing, new, well oiled. 208 Double Row, 1209 Single Row. Write or wire. United Hide, Iron & Metal Company, Elmira, New York.

**FOR SALE**—I have three Ford Garages with Ford Dealerships. Want to sell one or two of them. Write me for particulars. Address Box 6168 c/o MOTOR AGE, 5 S. Wabash avenue, Chicago, Illinois.

**FOR SALE**—Liberty aircraft engines 400 h. p. REQUIRED—Spare parts same engines. Agents wanted. Auguste Michel, Arsenal, Strasbourg, France.

**MOTOR AND TRANSMISSION** for service Model IX Truck. Good condition. Selling account State License too high. Address Box 6164, care of Motor Age, 5 S. Wabash Ave., Chicago, Ill.

## HELP WANTED

**ATTRACTIVE OPPORTUNITY FOR SALESMAN**—Experienced Pressed Steel and Stamping salesman, one with contact with automobile and other stamping users. Plant located in Middle West, offers attractive proposition to the right man. All correspondence held confidential. Address Box 6163, care of Motor Age, 5 S. Wabash Ave., Chicago, Ill.

**SALESMEN WANTED TO ACT AS DISTRIBUTORS ON INCANDESCENT AUTOMOBILE BULBS. TO CARRY STOCK AND MAKE DELIVERIES FROM THEIR CARS. GOOD OPPORTUNITY. ADDRESS BOX 6153 CARE OF MOTOR AGE, 5 S. WABASH AVE., CHICAGO, ILL.**

## SITUATIONS WANTED

Vice-President and General Manager of one of the largest successful corporations manufacturing automobile parts and accessories is ready to confer with parties interested in securing a real executive who knows thoroughly the manufacture and distribution of automobiles, motors, accessories, electric appliances and kindred lines. One who is capable of assuming full control of any concern regardless of size. Correspondence will be held strictly confidential. Address Box 6167, c/o Motor Age, 5 S. Wabash avenue, Chicago, Illinois.

If you haven't found what you want here, your advertisement here will find it for you



# "NORMA"

BALL BEARINGS



THE NORMA COMPANY OF AMERICA  
ANABLE AVE., LONG ISLAND CITY, N.Y.



# Index to the

The Advertisers' Index is published as a convenience and not as a part of the advertising contract. Every care will be taken to index correctly. No allowance will be made for errors or failure to insert.

Adjustable Bearing Co.....	102	Ditwiler Mfg. Co.....	94
Ahlberg Bearing Co.....	101	Durkee-Atwood Co.....	51
Akron-Selle Co., The.....	93		
Albertson & Co.....	62	Eastern Mach. Screw Corp.....	95
Allen Mfg. Co.....	100	Eaton Axle & Spring Co.....	73
Almond, T. R., Mfg. Co.....	99	Edelmann, E., & Co.....	92
American Asbestos Co.....	100	Electric Parts Corp.....	101
American Chain Co.....	47		
Amer. Hamm. Piston Ring Co.	99	Federal Tire Co.....	91
American Sales Book Co., Ltd.	99	Fisk Tire Co., Inc.....	98
Armature Rewinding Co., Inc.	95	Fitzgerald Mfg. Co., The.....	100
Arrow Grip Mfg. Co., Inc.....	92	Forest Electric Co.....	102
Autocoll Co., The.....	99	Foster-Johnson Reamer Co.....	98
Auto-Hone Co., The.....	101	Postoria Pressed Steel Co.....	76
Automotive Maintenance Machinery Co.....	101	Franklin Air Compressor Works	98
Auto Spring Control Co.....	101	Fredericks, H. M., Co.....	100
		Ft. Recovery Stirrup Co.....	94
		Fyrac Mfg. Co.....	98
Bearings Co. of America.....	97		
Bell Mfg. Co.....	88	Gardner Motor Co., Inc.....	100
Bellevue Mfg. Co.....	102	Gates Rubber Co.....	79
Biflex Corp., The.....	99	Gaylord Mfg. Co.....	102
Black & Decker Mfg. Co. 2nd Cover		Gemco Mfg. Co.....	90
Bosch Magneto Corp., American	56 & 57	General Automotive Corp.....	101
Bosch, Robert, Magneto Co.....	7	General Motors Chem. Co.....	68 & 69
Broadcaster Department.....	103	General Storage Battery Co.....	96
Brunner Mfg. Co.....	84	Gill Mfg. Co.....	Back Cover
Burd High Comp. Ring Co.....	101	Gilliam Mfg. Co.....	64
Business Methods Corp.....	96	Gilmer, L. H., Co.....	74
Butler Automotive Serv. Co.....	98	Goodrich-Lenhardt Mfg. Co.....	99
		Graton & Knight Mfg. Co.....	3
		Green Engineering Co.....	99
Canton Foundry & Mach. Co.....	95		
Carroll-Jamieson Machine Tool Co.	105	H. & H. Manufacturing Co.....	96
Case, J. I., T. M. Co.....	101	Hall Cylinder Hone Co., The.....	99
Chevrolet Bros. Mfg. Co.....	98	Hobart Bros. Co.....	102
Chicago Solder Co.....	101	Hollenden Hotel.....	104
Cincinnati Victor Co.....	88	Holt Mfg. Co., Inc.....	60
Cloyes Gear Works.....	100	Huetter Mach. & Tool Co.....	102
Conneaut Packing Co., The.....	101	Hyatt Roller Bearing Co.....	50
Continental Battery Co.....	100	Hyman Pressed Body Co.....	99
Cronk, E. D. & A. F., Inc.....	97		
Crosley Radio Corp.....	77	Indiana Piston Ring Co.....	2
Curtis Pneumatic Mach. Co.....	100	Indiana Rubber & Insulated Wire Co.....	81
		Inshield Prod. Co., The.....	85
Dall Motor Parts Co.....	95		
Davis, C. O. W., Motor Car Co.	49	Jacobs Auto Safety Lamp Co., Inc.	101
Detroit Steel Prod. Co.....	61	Johns-Manville, Inc.....	100
Dickerson, C. A., Compressor Corp.	98		

# Advertisements

Johnson Bronze Co.....	92	Reo Motor Car Co.....	8
Johnson Gas Appliance Co.....	102	Rice, Chas. W.....	94
Jordan Motor Car Co. Front Cover		Rose, Frank, Mfg. Co.....	101
		Ruby Chemical Co., The.....	97
K. D. Lamp Co., The.....	105		
Kawneer Co., The.....	102	Sav-Oil Ring Mfg. Co.....	96
Kellogg Mfg. Co.....	98	Service Equipment Associates.....	98
Kelso Mfg. Co.....	83	Shawver Co., The.....	97
Key Boiler Equip. Co.....	93	Simplicity Mfg. Co.....	94
King Mfg. Corp.....	102	Staff, J. Wadsworth.....	96
Kokomo Electric Co.....	63	Staynew Filter Corp.....	52 & 53
Kokomo Rubber Co.....	106	Stevens & Co.....	98
		Stewart-Warner Speed. Corp.....	102
Landis Tool Co.....	97	Storm Mfg. Co.....	96
Las-Stik Patch Mfg. Co.....	86	Studebaker Corp.....	5
Lincoln Products Co.....	102	Stutz Motor Car Co.....	3rd Cover
Lorentzen Headlight Kontrol, Inc.....	99	Suburban Transit Co.....	99
Louisville Electric Mfg. Co.....	94	Swan Carburetor Co.....	59
Lux Clock Mfg. Co.....	101		
Lyon Metallic Mfg. Co.....	72	Thermoid Rubber Co.....	65 & 66
		Thompson, W. O., Mfg. Co.....	102
Manley Mfg. Co.....	94	Timken Roller Bearing Co.....	102
Meachem Gear Corp.....	100	Tripp-Secord & Co.....	99
Mechanical Production Co.....	101		
Milwaukee Die Casting Co.....	100	U. S. Auto Supply Co.....	58
Mosler Metal Prod. Co.....	98	U. S. Chain & Forging Co.....	67
Mountain Accessory Co.....	100	U. S. Electrical Tool Co.....	82
		United Mfg. & Dist. Co.....	99
National Carbon Co.....	91	Universal Industrial Corp.....	100
New Departure Mfg. Co.....	75		
New Era Spring & Specialty Co.....	97	Vesta Battery Corp.....	70 & 71
No-Leak-O Piston Ring Co.....	102	Vitek Mfg. Co.....	101
Norma Co. of America.....	104		
Norwalk Auto Parts Co.....	98	Wall Pump & Compressor Co.....	102
		Watkins Mfg. Co.....	96
Oakes Co., The.....	54 & 55	Watson, John Warren, Co.....	101
Oakland Motor Car Co.....	6	Waukesha Motor Co.....	97
		Wayne Tool Mfg. Co.....	98
Packard Electric Co., The.....	100	Weaver Mfg. Co.....	1
Paraflector Co., The.....	102	Weidenhoff, Joseph, & Co.....	97
Peerless Motor Car Co.....	99	Welever Piston Ring Co.....	98
Pioneer Armature Co., Inc.....	96	Welker-Hoops Mfg. Co.....	86
Prest-O-Lite Co., Inc., The.....	78	Westcott Motor Car Co.....	4
		Wilkening Mfg. Co.....	100
R. & C. Manufacturing Co.....	80	Wood-Imes Mfg. Co.....	98
Radiant Oil Co., Inc.....	98		
Radiator Eng. Co.....	99	Zenith-Detroit Corp.....	100
Ramsey Acc. Mfg. Co.....	99		



Special Holiday Wrappings for Xmas Selling

A Newer and Better Stop Lamp

## No. 200 STOP LAMP

Here's a stop lamp which will give 100% service and satisfaction. Built sturdily to last for years. Throws a rapid warning which the car behind cannot overlook.

Made in one piece from suitable gauge steel, black enamel baked on. Brass door, polished and nickel plated. Special amber lens showing "stop" when brake is applied. Enclosed type switch. Packed in individual cartons.



FOR ATTACHING TO FENDER

## K-D Spot Lamp Is Low in Price

No. 275

Designed to meet the popular demand and render the utmost service. Overwhelmingly popular and a quick seller.

Single shell construction, reflector and body combined, pressed from heavy gauge brass. Steel brackets for open or closed cars. Bulbs adjusted by outside focusing screw. Four feet of cord furnished. Black enamel baked on with nickel-plated band enclosing glass.

Write for new illustrated catalog free.

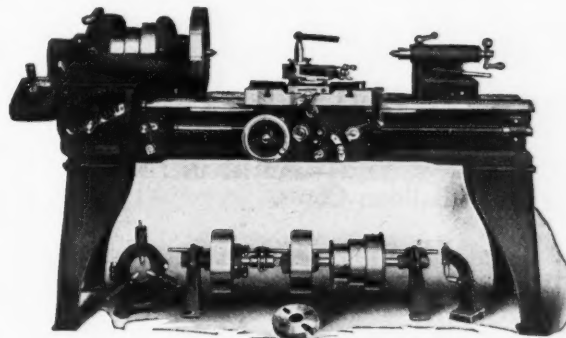
Samples and prices on request.

THE K-D LAMP CO., Cincinnati, Ohio



## C-J Profit Producing Lathes

Are Pioneers in their field, being the first modern Lathes to be adopted generally in auto service stations. A standard make, one of the oldest in the field, backed by many years successful service. Known and in use the world over.



13 inch; 15 inch; and 16 inch swing Quick Change Gear or Semi Quick Change Gear. ACCURATE; DURABLE; SIMPLE TO OPERATE.

Every worthwhile feature but not one superfluous feature is embodied in these quality Lathes.

HONESTLY BUILT

HONESTLY PRICED

Write today for Special Garage Bulletin "M.A."

The Carroll-Jamieson Machine Tool Company

Batavia, Ohio.



# *Note the ~ Multi-member Tread*



Kokomo Balloons are not just larger high-pressure cords. They are true balloon tires built on the new and better balloon principle.

For instance. The tread has been designed especially to meet balloon tire conditions. The triple ribbed center permits them to be steered as easily as high-pressure tires. The multi-member design counters any skidding force.

And, there are the rugged "bumpers" on the sidewalls. These provide protection against curb rubbing and lateral shocks.

In this one tire is embodied all that we have gained in thirty years of tire building experience.

Write—and let us tell you more about the many superior features of Kokomo Balloon Cords.

Kokomo Rubber Co., Kokomo, Indiana

LONG ~ LIFE  
**Kokomo**  
**Balloons**



# Getting the short end of it

**I**S the factory you are representing giving you an even break?

Are you getting as much co-operation as you are giving?

Are you being forced to take cars in greater quantities than you can assimilate them profitably?

Are you forced to assume responsibilities wholly out of proportion to the amount of business you can anticipate?

It is not necessary to permit yourself to be imposed upon in order to stay in the automobile business.

If you are "getting the short end of it," get out and look around. You'll find lots of good companies ready to give you a "fifty-fifty" break.

The Stutz is one of them. It knows that it can't succeed unless its dealers make money and it is doing everything within the realms of good, sound business to assure that.

If you have never investigated the Stutz proposition for your territory, it would pay you to do so. Write or wire.



# STUTZ SIXES

STUTZ MOTOR CAR COMPANY of AMERICA, Inc., Indianapolis, Indiana

*Builders of the Original and Genuine Stutz Motor Cars*





## Gill Pistons



## Turn Out Better Work By Using Gill Products of Quality

The mechanic must shoulder the responsibility for the efficient and satisfactory performance of the motor after it is overhauled. Your work cannot be any better than the parts you install.

The car owner wants a perfect running motor that will give him service and power. Gill Rings, Pins and Pistons coupled with first class workmanship will assure you satisfied customers.

### GILL MANUFACTURING CO.

8300 South Chicago Ave.

Chicago, Ill.

50¢



50¢



30¢



Prices are up to and including 4 inch



# Gill



## Rings, Pins *and* Pistons